

## **MISSOURI RIVER - POPLAR DRAINAGE**

### **PHYSICAL DESCRIPTION**

The Missouri-Poplar drainage includes the Missouri River from Fort Peck Dam downstream to its confluence with the Poplar River, Prairie Elk Creek, Wolf Creek, Redwater River and the Poplar River. The watershed encompasses approximately 4,000 square miles located in Valley, Roosevelt, Daniels and McCone counties. The watershed includes private, state and federal lands, including the majority of the Fort Peck Indian Reservation. Agriculture dominates the lands north of the Missouri River, with wheat farming being the dominant crop. Irrigated crops such as alfalfa and corn are grown within the valleys of the major rivers and streams. South of the Missouri River is a mix of rangeland dominated by native vegetation and dryland farming.

There are no natural lakes in the drainage that contain a fishery. There are, however, numerous stock ponds and many are managed as fisheries. The Fort Peck Dredge Cuts also have a fishery and are a series of lakes connected to the Missouri River, which were created by the hydrologic dredging that occurred with the construction of Fort Peck Dam. The Missouri, Redwater and Poplar rivers contain sport fisheries that include a host of native and introduced fishes.

### **FISHERIES MANAGEMENT**

The Missouri River downstream of Fort Peck Dam holds a diverse assemblage of both native and non-native fish species. Its proximity to the county seats of Glasgow and Wolf Point make it a popular fishery in northeastern Montana. Native fish species targeted by anglers include sauger, channel catfish, shovelnose sturgeon, burbot and paddlefish. Anglers also pursue a number of nonnative game fish species including walleye, northern pike, and rainbow trout. The Missouri River is managed as a wild fishery, with no stocking of game fish currently taking place. However, in the past, the Missouri River was stocked with a multitude of species for angling purposes. These past stocking practices in the river, along with current stocking practices in reservoirs have significantly influenced the current fish assemblage. Currently, water bodies such as Fort Peck Reservoir and smaller ponds that are at times connected to the Missouri River are stocked with **nonnative** species, including, walleye, Chinook salmon, northern pike, yellow perch and largemouth bass. **Today**, this reach of the Missouri River is home to over 50 species of fish, which consists of at least 31 native species and a minimum of 19 nonnative species.

Angling on the Missouri River occurs year-round with the spring and summer months being the most popular. Although ice fishing does occur on the Missouri River, it is limited to a few deepwater holes where good ice forms.

Since the Fort Peck Indian Reservation borders a large proportion of the north side of the Missouri River in this drainage, the Reservation and State have the same harvest regulations. Anglers are allowed one daily bag limit, no matter what side of the river you are fishing, and even if they have a state and tribal fishing license. Special harvest regulations are implemented for paddlefish and rainbow trout. Only one paddlefish can be harvested per year and anglers are required to have a yellow tag to fish in the Missouri River downstream of Fort Peck Dam or the Yellowstone River. An archery season for paddlefish occurs in the Fort Peck Dredge Cuts, where anglers are allowed one fish per year and a blue tag is required. The daily bag limit on rainbow

trout downstream of Fort Peck Dam is two fish, instead of the five that are allowed on other regional waters.

The Redwater River runs south to north through McCone and a portion of Dawson County. The Redwater River enters the Missouri River at river mile 1682, across the river from the town of Poplar, Montana. Game fish present include channel catfish, sauger, northern pike and walleye. The Redwater River hosts 21 native and nine non-native species. Some of the non-native, non-game fish include western silvery minnows, plains minnows, sturgeon chubs, flathead chubs, fathead minnows, northern redbelly dace, river carpsuckers, bigmouth buffalo, smallmouth buffalo, shorthead redhorse, white sucker, goldeye and brook stickleback.

Channel catfish and northern pike are popular game fishes that anglers target in the Redwater River. During the spring and early summer, anglers fish for channel catfish and sauger in the lower portion of the Nickwall Road crossing. This crossing is located approximately one river mile upstream from the confluence and precludes fish passage during most seasons in the majority of years and aggregations of channel catfish and sauger occur below the crossing. Eastern District harvest regulations are in place on all portions of the Redwater River.

The Poplar River drainage is situated on the north side of the Missouri River and encompasses portions of Roosevelt, Daniels and Valley counties, as well as Saskatchewan, Canada. The East Fork meets with the Poplar River near the town of Scobey, while the West Fork enters the Poplar River just south of the Fort Peck Reservation, in Roosevelt County. A dam is located on the mainstem Poplar River just north of the Canadian border and has a great influence on the river's hydrograph. In the years before the dam, sauger and walleye were relatively abundant in the upper portions of the Poplar River. However, angler success has diminished since the construction of the Canadian dam. Current knowledge of the fishery is limited.

Several prairie ponds within the drainage are stocked with game fish to provide fishing opportunities. The deeper ponds have been stocked with game fish such as northern pike, yellow perch, white and black crappie, and largemouth bass; these are meant to be self-sustaining. Shallower ponds that have a tendency to winter kill are often stocked with hatchery-produced rainbow trout that are stocked either annually or biannually.

## **HABITAT**

The construction of Fort Peck Dam significantly altered the habitat of the Missouri River. Fort Peck Reservoir acts as both a sediment and nutrient sink for the Missouri River, and therefore delivers sediment-free and nutrient-poor water to the Missouri River downstream of the dam. The dam prevents all fish from migrating upstream. The dam has also greatly altered the natural flow regime of the Missouri River by holding back spring freshets and discharging higher than natural flows during the winter months. Channel-forming flows have been few and far between since the dam closed off the river in 1937. Fort Peck Dam provides hydroelectric power by drawing reservoir water through its penstocks into the powerhouse. The water that is used for power generation comes from the bottom of Fort Peck Reservoir, which is cold year round. During the spring and summer months, this colder water greatly reduces the water temperature of the Missouri River for approximately 180 river miles. Although water temperature does rise with increasing distance from the dam, average water temperatures in the lower Missouri River near

its confluence with the Yellowstone River is 2° F colder than water upstream of Fort Peck Reservoir.

The altered habitat of the Missouri River due to Fort Peck Dam is evident in the presence and absence, as well as the relative abundance, of native fishes. Several species, such as sturgeon and sicklefin chubs, western silvery minnows, channel catfish and stonecats, become more abundant with distance downstream from Fort Peck Dam. Additionally, the growth rates of fish species like sauger, channel catfish and even pallid sturgeon are slower in the Missouri River near Fort Peck Dam when compared to the lower Missouri or Yellowstone Rivers. For some species like channel catfish, water temperatures may stay too cold to even meet their minimum spawning requirements.

Large irrigation and municipal intakes are located on this section of the Missouri River, both in Valley County and on the Fort Peck Reservation. One intake is located south of Wiota and the second near the town of Frazer and Pickthorn Bay. The effect of these intakes on fish populations of the Missouri River is currently unknown. In addition, numerous floating irrigation pumps are located on the river. FWP recommends fish screens for these pumps and these are mandated through the local conservation districts.

Two fish passage barriers on the Redwater River likely block fish passage during normal flow periods. The first barrier is located one mile upstream of the confluence with the Missouri River at the Nickwall Road crossing and the other is upstream at the Redwater Road crossing. Although fish passage routinely does not occur at these sites, the high water of 2011 likely passed fish at the Nickwall Crossing since several large river species were captured upstream of the crossing.

The largest habitat alteration to the Poplar River system has been the construction of a dam for a power plant located in Saskatchewan, Canada. This dam has significantly altered the natural flow regime of the Poplar River. In addition, irrigation withdrawals greatly impact the system. There are several periods throughout the year that the Poplar has little to no water flowing at its mouth.

## **FISHING ACCESS**

The majority of the fishing waters in the drainage are situated on private lands. In addition, a large proportion of the Missouri River's north banks are located on Fort Peck Reservation land. While the Missouri River has five fishing access sites throughout its 180 mile course, public access is very limited due to reservation boundaries and access site spacing. In general, access sites are more than 60 river miles apart, too far for day float trips.

The Redwater River winds through mostly private lands and access is difficult. The main access locations are at county bridge crossing right-of-ways. Similarly, the Poplar River runs through mainly private lands with the majority of access occurring at bridge crossings. A large part of the lower Poplar River is also situated on Fort Peck Reservation lands.

The Fort Peck Dredge Cuts are surrounded by U.S. Army Corps of Engineers land and have good access, including three boat launches. The majority of prairie ponds that FWP stocks within the area are on private land, but landowners allow public access through an agreement with FWP.

### **SPECIAL MANAGEMENT ISSUES**

The pallid sturgeon was listed as endangered in 1990 under the federal Endangered Species Act of 1973. The wild population of pallid sturgeon in the Missouri River downstream of Fort Peck Dam has had no documented natural recruitment since Garrison Dam was closed off in the 1950's. Up until 1998 the entire population was made up of old-aged fish of large sizes. Due to the lack of natural recruitment, propagation efforts commenced in 1997, with the first stocking of pallid sturgeon into the river occurring in 1998. Since that time, thousands of hatchery-reared pallid sturgeon were stocked into the river. The stocking program has been successful in staving off the extirpation of this species in the Missouri River, although habitat alterations to promote natural recruitment have been limited.

The USACE has obligations under the ESA to aid in the recovery of endangered species affected by the operation of Missouri River dams. In the 2000 Missouri River Biological Opinion and the subsequent 2003 amendment to the Biological Opinion, the USFWS listed two Reasonable and Prudent Alternatives that were directed at the operations of Fort Peck Dam relative to pallid sturgeon recovery. One was a spillway test, where warm water would be spilled over Fort Peck Dam's spillway during the spring and early summer to warm the river's water temperature. The second was to examine the potential to selectively withdrawal water out of Fort Peck Dam to increase water temperatures throughout the fish's growing season. Due to a long drought in the Missouri River basin, the reservoir elevations were too low to spill and a test was never accomplished. However, due to the record setting snowfall on the eastern Montana prairie in the winter of 2010/2011 and the subsequent wet spring, Fort Peck Reservoir filled and the USACE spilled over Fort Peck Dam in 2011. Although this spill event was not designed to elicit a response of pallid sturgeon, it did. During the spring of 2011, up to 40% of the adult pallid sturgeon population moved into the Missouri River in Montana and stayed in the river throughout the spawning season. The migration began to occur when flows were just over 20,000 cfs. During early July an aggregation of adults was found in the Missouri River just downstream of the mouth of the Milk River, which is only one mile downstream of the Spillway channel. A few days later a wild larval pallid sturgeon was collected, which is the first genetically confirmed wild produced pallid sturgeon larvae ever collected in the Missouri River drainage. These results indicate that spring discharge from the Missouri River will trigger wild pallid sturgeon to use the river for spawning and that spawning can be successful.

While successful spawning was confirmed in 2011, it is not known if these fish will recruit to older ages. Past studies have found evidence to support the hypothesis that the drift distance of larval pallid sturgeon could be the limiting factor causing the recruitment bottleneck. Larval pallid sturgeon drift for days after being hatched and with the large reservoirs on the mainstem Missouri, the distance between reservoirs may be too short. However, 2011 was the first time in decades that flows out of the Fort Peck Dam project were sufficient to induce adults to migrate into, and spawn in, the Missouri River, and future discharge events are needed to further evaluate spawning and subsequent recruitment.



PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

FISHERIES MANAGEMENT DIRECTION FOR MISSOURI RIVER - POPLAR DRAINAGE

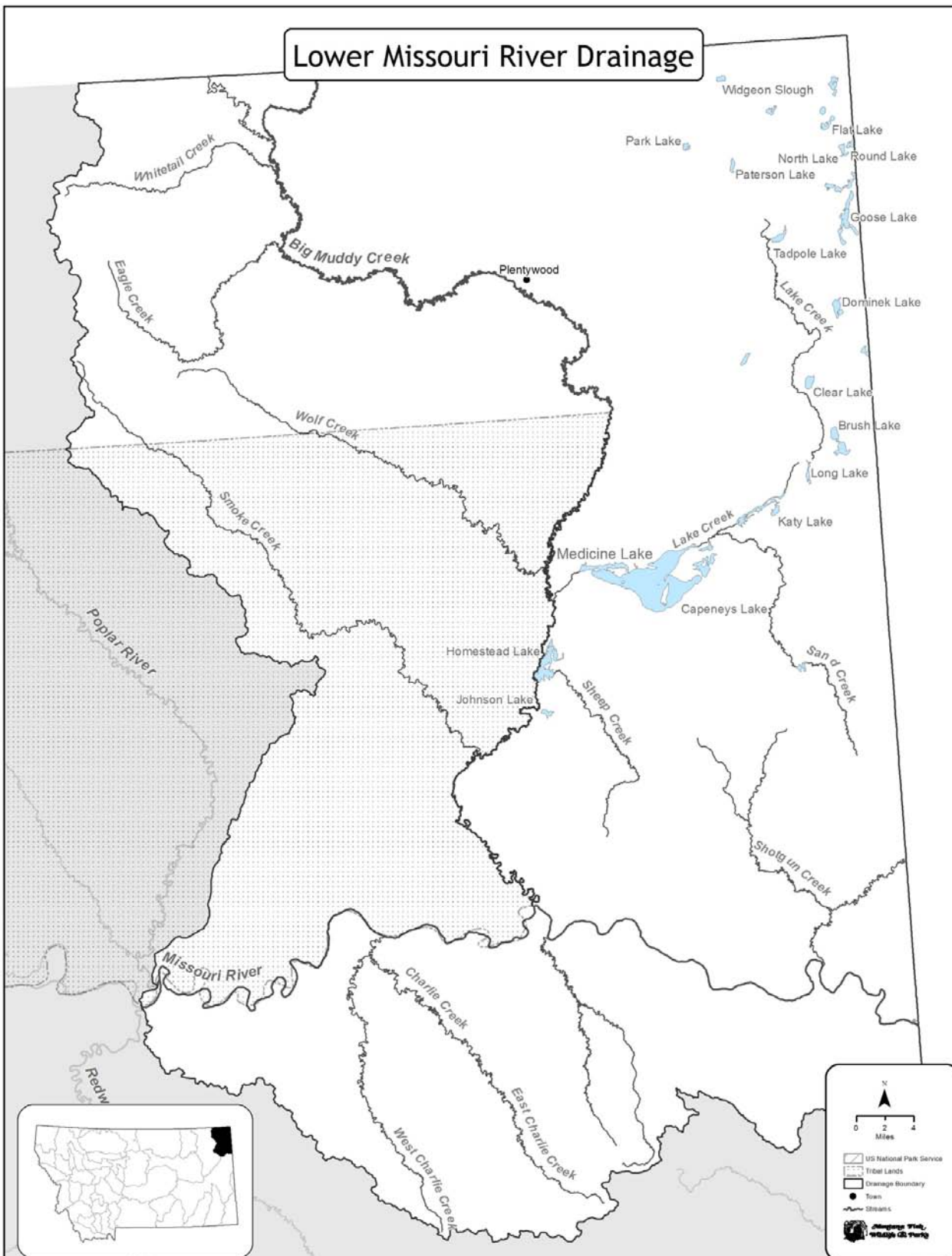
Water	Miles/Acres	Species	Recruitment Source	Management Type	Management Direction
Missouri River - Fort Peck Dam to the confluence with the Poplar River	92 miles	Pallid sturgeon (N)	Wild/ Hatchery	Conservation	Restore a self-sustaining population of pallid sturgeon in the Missouri River. Work towards modifying operations at Fort Peck Dam that are beneficial for spawning and growth.
		Paddlefish (N)	Wild	Restrictive Regulations	Continue to allow the unique opportunity for paddlefish snagging in the Missouri River. Monitor the fishery.
		Shovelnose sturgeon (N), Sauger (N), Channel catfish (N)	Wild	General	Monitor populations to be certain that overexploitation does not occur. Maintain habitat for all life stages. Better understand how operations of Fort Peck Dam and the Missouri River's tributaries influence production, recruitment and population structure of these native game fishes.
		Rainbow trout	Wild	Restrictive Regulations	Monitor population to make sure overexploitation does not occur. Better understand how angling pressure and harvest may be impacting this species.
		Walleye	Wild	General	Allow harvest to keep population size in check to minimize hybridization with native sauger
		Native non-game fishes (N)	Wild	General	Monitor the native non-game fishes to better understand how operations of Fort Peck Dam and tributaries influence these populations.
Fort Peck Dredge Cuts	542 acres	Paddlefish (N)	Wild	Restrictive Regulations	Continue to allow the unique opportunity for bow fishing in the Dredge Cuts. Improve

PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/Acres	Species	Recruitment Source	Management Type	Management Direction
		Sauger (N), Channel catfish (N), Walleye, Northern pike, Burbot (N)	Wild	General	knowledge relating to the population dynamics of these fish.  Maintain a quality fishery (size and catch rate) for both native and non-native game fishes. Continue to monitor these populations.
Redwater River	153 miles	Channel catfish (N), sauger (N)	Wild	General	Maintain numbers.
		Native non-game fishes (N)	Wild	Conservation	Protect habitat for native fishes. Provide fish passage at stream crossings.
Habitat needs and activities: Get functional fish passage for all species at the Nickwall Road crossing.					
Poplar River (Canadian border to mouth)	107 miles	Sauger (N), Channel catfish (N), Northern pike	Wild	General	Begin to understand fish assemblage, population size of game fishes, identify habitat problems.
Prairie Ponds	Various	Yellow perch, Largemouth bass, Northern pike	Wild	General	Continue to monitor these populations and stock fish when necessary. Look for opportunities to increase the quality of habitat by increasing the depth of reservoirs, building new reservoirs, etc.
		Rainbow trout	Hatchery	Put-Grow-Take	Continue to stock prairie ponds with put, grow and take fisheries. Evaluate angler use and evaluate which ponds should be stocked. Look for opportunities to improve habitat where applicable.







## **LOWER MISSOURI RIVER DRAINAGE**

### **PHYSICAL DESCRIPTION**

The Missouri-Big Muddy drainage encompasses approximately 3,750 square miles of land in Roosevelt, Richland, Sheridan and Daniels Counties. The main artery of the drainage is the Missouri River from the confluence of the Poplar River to the North Dakota Border, about 94 river miles. The largest tributary to the Missouri River within the drainage is Big Muddy Creek, which flows from north to south through Sheridan and Roosevelt counties and forms the eastern boundary of the Fort Peck Reservation. Agricultural lands dominate the landscape in the northern portions of the drainage, with grain being the dominant crop. To the south of the Missouri River in its furthest downstream portions, sharp breaks in vegetation occur. Throughout the river bottomlands, irrigated agriculture occurs intermixed with intact cottonwood riparian zones.

Box Elder and Whitetail Reservoirs are the two largest and most fished flatwater fisheries in the drainage and are both located in Sheridan County. Box Elder Reservoir is situated just north of the town of Plentywood, while Whitetail Reservoir is located at the town of Whitetail near the Canada border. Various other smaller prairie ponds located mainly on private land are located within the drainage.

### **FISHERIES MANAGEMENT**

The lower Missouri River, while significantly altered due to the influence of Fort Peck Dam upstream, holds a more naturalized fish assemblage than portions in closer proximity to the dam. Native game fishes such as channel catfish, sauger and shovelnose sturgeon are abundant, as are native non-game cyprinids including sicklefin and sturgeon chubs. The lower Missouri River is an important juvenile rearing area for several species of fish that spawn further upstream in the system. This is the only area of the Missouri River downstream of Fort Peck Dam where young-of-the-year sauger, shovelnose sturgeon and channel catfish are routinely found.

Both wild and hatchery-produced pallid sturgeon are found in higher densities within this section of the Missouri River, when compared to upstream areas. After stocking, hatchery-reared juvenile pallid sturgeon tend to congregate in the lower sections of the Missouri River, most likely due to the higher abundance of native forage fish and more natural temperature and suspended sediment loads. Growth rates of pallid sturgeon and other native fishes are likely higher in this section due to the increased summer water temperatures.

The Missouri River is managed as a wild fishery, with no stocking of game fish currently taking place. However, both past and current stocking practices (in Fort Peck Reservoir) have significantly influenced the current fish assemblage. In the past, upper portions of the Missouri River below Fort Peck Dam were stocked with a multitude of species for angling purposes and many of those fish have colonized the river, including the downstream portions. Today the Missouri River is home to over 50 species of fishes, which consists of at least 31 native species and a minimum of 19 introduced species. Due to the more natural habitat of the lower Missouri River, introduced fishes are less abundant than in portions of the river closer to Fort Peck Dam.

Fishing regulations for the lower Missouri River are similar to that of the upper portions of the river below Fort Peck Dam with general Eastern District regulations in place for the majority of species. Special regulations are in place for the reach of the Missouri River from Fort Peck Dam to the mouth of the Milk River. These regulations are in place to protect the limited coldwater fishery that resides in this tailwater reach. Angling on the lower Missouri River occurs year round with the spring and fall months being the most popular. Although ice fishing does occur it is limited to a few deepwater holes where good ice forms.

Big Muddy Creek hosts a wide variety of native and introduced fishes. Little fisheries data have been collected on Big Muddy Creek over the past few decades. Game fish including channel catfish, sauger and walleye are all found in the lower sections of the creek that are connected to the Missouri River. The upper portions of Big Muddy Creek are home to pearl dace, a Montana Species of Concern that is rare in Montana.

Box Elder Reservoir, also known as Bolster Dam hosts a walleye, northern pike, yellow perch and black bullhead fishery. In the past decade several hundred thousand walleye have been stocked into Box Elder Reservoir. While walleye were abundant, the yellow perch fishery crashed to a low in 2009. For the past couple of years walleye stocking has been stopped to try and reestablish the yellow perch fishery. Several thousand adult yellow perch have been transferred into Box Elder Reservoir since 2010 to try and restart the population. A special daily bag limit of 25 yellow perch has been implemented on Box Elder Reservoir.

Anglers fish for walleye in the spring and summer months, while northern pike are currently the main target during the winter. Anglers harvest the occasional trophy northern pike through the ice and often use a spear to do so.

Whitetail Reservoir is a relatively shallow reservoir with maximum depths less than 15 feet. It is prone to winter kill when snow accumulates, and did have a large die off in the winter of 2010/2011. While northern pike were still abundant, yellow perch, channel catfish and rainbow trout were stocked during 2011 to try to rebound from the large winter kill.

Several prairie ponds within the drainage are stocked with game fishes to provide fishing opportunities. The deeper ponds have been stocked with game fish that are meant to be self-sustaining, such as northern pike, yellow perch, white or black crappie, and largemouth bass. Shallower ponds that have a tendency to winter kill are often stocked with hatchery-produced rainbow trout that are stocked either annually or biannually.

## **HABITAT**

While still highly altered from the presence and operations of Fort Peck Dam, the section of the Missouri River in this drainage is much more natural in its physical and chemical properties when compared to upstream reaches. This more natural appearance is mostly due to tributary influence, bank erosion along the river's course and solar radiation. As such, the lower section of the Missouri River is appreciably warmer during the summer and carries much more suspended sediment than its upstream sections. A more natural fish assemblage exists and consists of several native fish that are uncommon closer to the dam.

The lower sections of the Missouri River are the most important juvenile rearing areas for several native game fish within the Missouri River. For that reason, it is important to protect

these areas by providing the oil and gas industry with up-to-date information which will assist in making informed decisions of how to minimize negative impacts to the aquatic environment. Numerous floating irrigation pumps are located along the river. Fish screens on these pumps are recommended by FWP and mandated through the local conservation districts. Recently, applications are being processed to sell water (market water) to oil companies to be used in the process known as fracking. Fracking involves injecting 1-3.5 million gallons of pressurized water into each oil well to shatter the shale and allow the oil to flow freely. Cumulative impacts of water extraction from the Missouri River will be monitored.

Several road crossing occur along the length of Big Muddy Creek. Documenting these crossings and understanding how they may affect fish migrations is of importance. Irrigation withdrawals also impact the habitat of Big Muddy Creek, and during various periods within the year the creek has limited water.

### **FISHING ACCESS**

The north side of the Missouri River from the Milk River to the mouth of Big Muddy Creek is on the Fort Peck Reservation. Off the reservation and further downstream, limited public land is situated adjacent to the river, with a few exceptions of State lands and lands administered by the Bureau of Land Management. Only two public fishing access sites can be found in this 94 mile stretch of the Missouri River, the Culbertson Bridge FAS and the Snowden Bridge FAS. Both sites had boat launches; however during the floods of 2011 the Snowden site was severely damaged and the boat launch is no longer there.

The majority of Big Muddy Creek flows through private land and the western banks of the lower portion are bordered by the Fort Peck Reservation. Access can be found at a few State sections and at county road crossings.

Box Elder and Whitetail Reservoirs are both readily accessible to the public. Box Elder Reservoir is owned by Sheridan County and has two concrete boat ramps. The local Walleyes Unlimited chapter is placing two handicapped accessible fishing piers in the reservoir in the summer of 2012. Whitetail Reservoir is a State FAS and has a gravel boat ramp.

### **SPECIAL MANAGEMENT ISSUES**

The pallid sturgeon was listed as endangered in 1990 under the federal Endangered Species Act of 1973. The wild population of pallid sturgeon in the Missouri River downstream of Fort Peck Dam, which includes the Missouri-Big Muddy Drainage, has had no documented natural recruitment since Garrison Dam was closed off in the 1950's. Up until 1998 the entire population was made up of old aged fish of large sizes. Due to the lack of natural recruitment, propagation efforts commenced in 1997, with the first stocking of pallid sturgeon into the river occurring in 1998. Since that time, thousands of hatchery reared pallid sturgeon have been stocked into the river. The stocking program has been successful in staving off the extirpation of this species in the Missouri River, although habitat alterations to promote natural recruitment have been limited.

The Missouri River within the Missouri-Big Muddy Drainage is critical habitat for rearing pallid sturgeon of all life stages. It has been shown that if pallid sturgeon are going to be able to successfully recruit to the system, the lower portions of the Missouri River will likely be the

nursery habitat. In addition, hatchery-reared juvenile pallid sturgeon that have been stocked into the system are found in greater abundance in this section of the river than in its upstream counterparts. The greater abundance of native cyprinids also makes this an important area for juvenile and adult pallid sturgeon. With a larger food supply and higher summer water temperatures, this is the best place on the river for pallid sturgeon to make a living.

Several native Missouri River fishes including pallid and shovelnose sturgeon, paddlefish and sauger have evolved with a strategy of drifting for several days after being hatched. This life-history strategy coupled with spawning on hard surfaces such as gravel or cobble, make the lower Missouri River the most important rearing area for these fishes. Since very little hard substrate occurs in the lower portion of the river, many native fishes migrate upstream to reaches that contain the desired hard substrates to lay their eggs on. Once their eggs hatch, their larvae drift downstream where they begin freely swimming and feeding. The lower Missouri River has been identified as having the highest densities of young-of-the-year shovelnose sturgeon and sauger. In addition, the lower river is the only place where abundant young-the-year burbot have only been found, further supporting the belief that this is a critical rearing area.

Although this is a critically important area of the Missouri River for pallid sturgeon as well as numerous other native fishes, modifications to Fort Peck Dam will need to occur for the river to come closer to reaching its natural carrying capacity. Water temperatures are warmer in the downstream sections, nevertheless they are still colder during the summer months than river temperatures above Fort Peck Dam. Warmer water temperatures would increase the productivity of the system in several ways. Warmer water would likely increase macro invertebrate production, which is a key food group for numerous species of fish. Additionally, warming up the river would likely extend the fish growing season, which would positively benefit most all of the native species present. Lastly, warmer water would likely increase the survival rates of fishes, since they would spawn earlier and their progeny would go into winter at larger sizes with better condition.

Channel maintaining flows are also needed in the lower Missouri River to create more natural habitats that native fishes utilize. Currently, very few high water events occur in the Missouri, which reduces the complexity of the river which inherently affects native fishes. Spring flows would not only create habitat, but would also elicit a migration and spawning response of many native fishes that currently do not get that trigger often enough.



**FISHERIES MANAGEMENT DIRECTION FOR LOWER MISSOURI RIVER DRAINAGE**

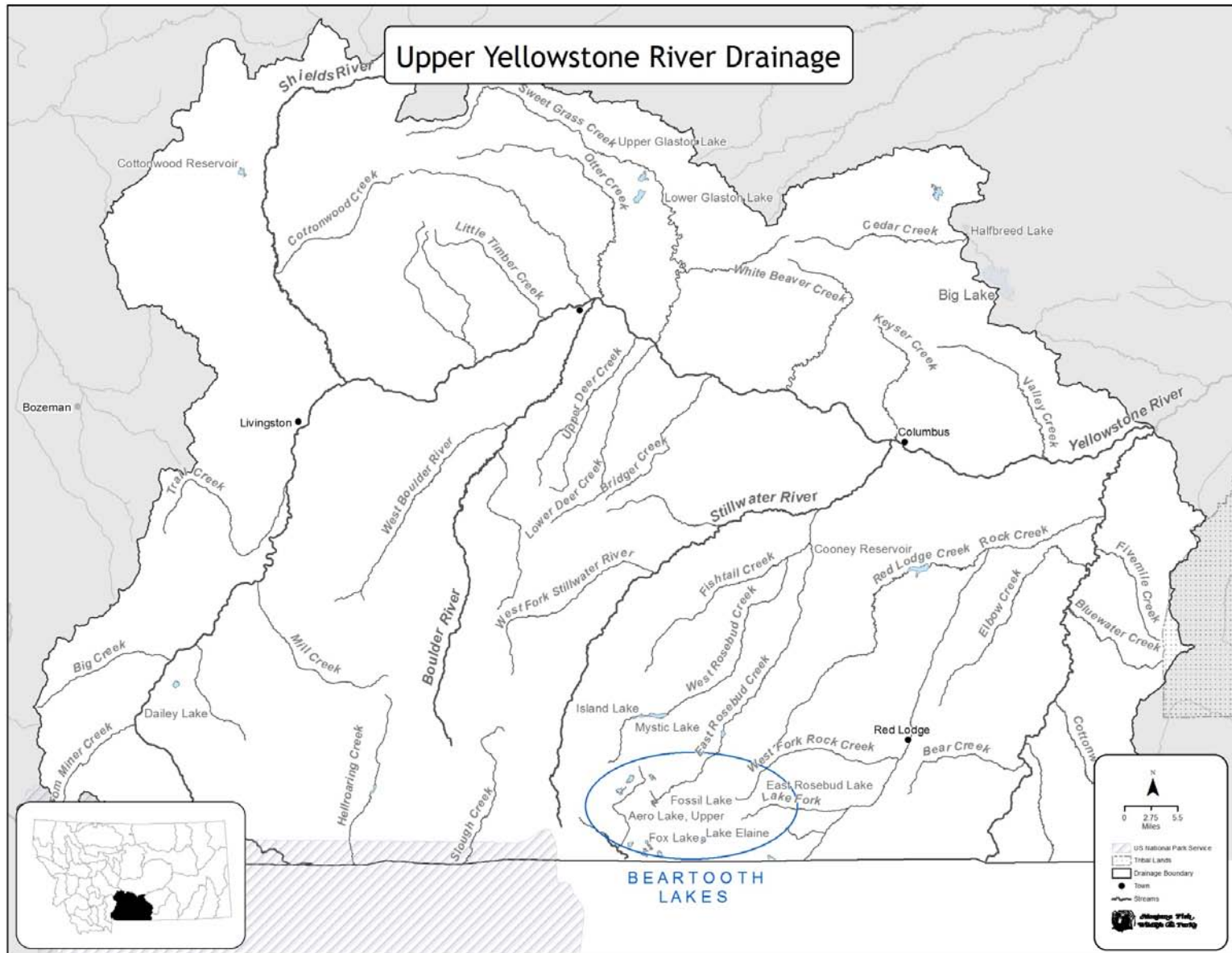
Water	Miles/Acres	Species	Recruitment Source	Management Type	Management Direction
Missouri River - Confluence of Poplar River to North Dakota border	94 miles	Pallid sturgeon (N)	Wild/ Hatchery	Conservation	Restore a self-sustaining population of pallid sturgeon in the Missouri River. Work towards modifying operations at Fort Peck Dam that are beneficial for spawning and growth.
		Paddlefish (N)	Wild	Restrictive Regulations	Continue to allow the unique opportunity for paddlefish snagging in the Missouri River. Monitor the fishery.
		Shovelnose sturgeon (N), Sauger (N), Channel catfish (N)	Wild	General	Monitor populations to be certain that overexploitation does not occur. Maintain habitat for all life stages. Better understand how operations of Fort Peck Dam and the Missouri River's tributaries influence production, recruitment and population structure of these native game fishes.
		Walleye	Wild	General	Allow harvest to keep population size at levels which will minimize hybridization with native sauger
		Native non-game fishes (N)	Wild	Conservation	Monitor the native non-game fishes to better understand how operations of Fort Peck Dam and tributaries influence these populations.
Big Muddy Creek (Canadian border to mouth)	194 miles	Channel catfish (N), Sauger (N)	Wild	General	Maintain numbers. Inventory habitat issues, such as fish passage barriers and unscreened diversions.
		Native non-game fishes (N)	Wild	Conservation	Protect habitat for native fishes. Provide fish passage at stream crossings.



PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/Acres	Species	Recruitment Source	Management Type	Management Direction
Box Elder Reservoir	77 acres	Yellow perch, Walleye, Northern pike	Wild/ Transfer	General/ Restrictive Regulations	Continue to monitor these populations. Evaluate the yellow perch transfers and the discontinued walleye stocking. Limit harvest of yellow perch until the fishery rebounds.
Whitetail Reservoir	25 acres	Yellow perch, Northern pike	Wild	General	Continue to monitor populations. Stock fish after winter kills. Evaluate balance between yellow perch and northern pike.
Prairie Ponds	Various	Yellow perch, Largemouth bass, Northern pike	Wild	General	Continue to monitor these populations and stock fish when necessary. Look for opportunities to increase the quality of habitat by increasing the depth of reservoirs, building new reservoirs, etc.
		Rainbow trout	Hatchery	Put-Grow-Take	Continue to stock prairie ponds with put, grow and take fisheries. Evaluate angler use and evaluate which ponds should be stocked. Look for opportunities to improve habitat where applicable.





## **UPPER YELLOWSTONE RIVER DRAINAGE**

### **PHYSICAL DESCRIPTION**

The Upper Yellowstone River flows for more than 180 miles from the Montana/Wyoming border to the mouth of the Clarks Fork of the Yellowstone, through Park, Sweet Grass, Stillwater and Yellowstone counties. This section of river, referred to here as the Upper Yellowstone Drainage, supports a quality coldwater fishery in relatively unaltered habitat. The Upper Yellowstone is free flowing, with no dams or river-wide diversion structures present. Most of the river flows through range and crop land traditionally managed for agriculture, but faced with increasing pressure from residential development. Towns and cities along this reach of the Yellowstone include Gardiner, Livingston, Big Timber, Columbus, and Laurel. Significant recreational river use also comes from the population centers of Bozeman and Billings.

Several large tributaries flow into the Upper Yellowstone River, including the Shields, Boulder, Stillwater and Clarks Fork. Numerous smaller, coldwater tributaries flow into the river upstream from Livingston, while a mix of coldwater streams draining from nearby mountains (Bridgers, Bangtails, Gallatins, Crazies, Absarokas, and Beartooths), and warmer water prairie streams enter the Yellowstone between Livingston and Laurel. In total, there are approximately 3,200 miles of fish-bearing stream occurring within 433 streams within the drainage. Additionally, there are 524 lakes, totaling 10,516 surface acres.

### **FISHERIES MANAGEMENT**

The upper Yellowstone River drainage supports a very popular, high quality trout fishery throughout its length. In addition to the fishery of the mainstem Yellowstone, many of the tributaries provide high quality trout fisheries. Above Livingston, the Upper Yellowstone provides a popular sport fishery for rainbow trout, brown trout and Yellowstone cutthroat trout. The tributaries support Yellowstone cutthroat, rainbow, brown and brook trout fisheries as well. Downstream from Livingston, the mainstem and tributaries of the Yellowstone support high quality fisheries for brown and rainbow trout, but Yellowstone cutthroat trout numbers decline moving downstream, and only the occasional cutthroat is caught below Big Timber. Other fish species in the Upper Yellowstone include mountain whitefish and several species of nongame fish, both native and nonnative.

Angling in the Upper Yellowstone River and all major tributaries is open year round, but is limited by cold weather and ice in winter and high stream flows during runoff and associated turbid water. Angling on smaller streams is restricted to the period from the 3<sup>rd</sup> Saturday in May through November 30.

All flowing waters in this drainage that support self-sustaining trout populations are managed as wild trout fisheries, emphasizing habitat protection and natural reproduction. Tributary streams and their connectivity with the Yellowstone are critical for reproduction, as many of the tributaries contain much higher quality spawning habitat than does the Yellowstone River. This connectivity is particularly important for Yellowstone cutthroat trout because their spawning use

of the main stem of the river is limited. Fishing regulations are tailored to protect trout fisheries and satisfy angler demand.

Several lowland lakes and reservoirs, and hundreds of high mountain lakes are part of the Upper Yellowstone Drainage. Two of the lowland lakes, Cooney Reservoir and Dailey Lake, are managed for balanced walleye/trout fisheries via stocking, fishing regulations and other strategies. Dailey Lake is managed for a perch fishery as well. The high mountain lakes are managed to provide maximum angler benefit while minimizing impacts to forest lands and Wilderness, promoting native Yellowstone cutthroat trout restoration, and creating opportunities to catch rare and unique fish species. Fish species in the mountain lakes include Yellowstone cutthroat, rainbow, brook and golden trout, as well as Arctic grayling. Yellowstone cutthroat trout, golden trout and Arctic grayling are stocked in selected mountain lakes on a regular basis. Two mountain lakes, Goose Lake and Sylvan Lake, are brood sources for Yellowstone cutthroat and golden trout that are stocked throughout the state. An important objective of mountain lakes management is to avoid conflicting or compromising fisheries management in streams downstream of the lakes in the same drainage.

Restoration of native Yellowstone cutthroat trout has been a priority in the Upper Yellowstone Drainage. The species has been severely diminished in population size and distribution during human development, and is limited to the upper end of the Yellowstone River and tributaries (above Springdale), and the headwaters of tributaries to the Yellowstone downstream from Springdale. Strategies to protect and restore Yellowstone cutthroat trout populations include maintaining connectivity with spawning tributaries and limiting angler harvest in the upper end of the drainage, and isolating the species using passage barriers to protect it from nonnative trout in tributaries to the lower end of this reach. Several projects in recent years have included building fish passage barriers, chemically removing nonnative trout from above the barriers, and reintroducing cutthroat trout in these streams. These strategies have been successful for recovering several cutthroat trout populations. These new populations have been managed as sport fish: all cutthroat trout in tributaries to the Yellowstone downstream from Springdale are part of an angler's daily trout limit. This regulation strategy has helped build public support for cutthroat trout restoration projects. The long-term goal for cutthroat conservation in the Upper Yellowstone (above Springdale) is to have 20% of the historically occupied habitat restored to cutthroat trout. In the Shields River, upstream from Chadbourn Diversion, the long-term goal for Yellowstone cutthroat trout<sup>5</sup> conservation is to have 100% of the historically occupied habitat restored with secure conservation populations of Yellowstone cutthroat trout.

## **HABITAT**

Although it is the longest undammed river in the contiguous United States and much of the river remains unaltered, significant habitat changes have impacted the Upper Yellowstone River since human settlement. Notable historic development along the Yellowstone River corridor includes the construction of a major railroad, as well as numerous roads to accommodate vehicle travel, including county roads, state highways and more recently a federal interstate highway. All of these developments have, in some way, impacted the river's ability to migrate laterally and interact with its historic floodplain. Using angular rock or concrete rip rap to protect roads, bridges, homes, and farmland or ranchland has restricted the natural expression of the river, and

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<sup>5</sup> As described in the Yellowstone Cutthroat Trout Conservation Strategy for the Shields River Watershed above Chadbourne Diversion.

possibly the quality of fish habitat in the river. Significant development is ongoing and may accelerate along the Yellowstone, particularly in the form of residential housing, which may further impact habitat.

An adequate quantity of cool, oxygenated water is necessary for survival and growth of trout in the upper Yellowstone River. The Yellowstone, Shields, Stillwater and Boulder rivers are all considered priority waters under FWP's drought policy and face potential fishing closures during severe drought conditions that can occur in late summer. In addition to these waters, Rock Creek and the Clarks Fork of the Yellowstone are both severely dewatered from irrigation in specific areas on certain years. Trout populations in these waters can be expected to fluctuate over the years in response to water availability. Other small tributaries in the drainage can also be impacted by irrigation withdrawals.

The operation of irrigation diversions and ditches in the Upper Yellowstone Drainage leads to the entrainment of hundreds of thousands, if not millions of fish each year. Many of these fish are returned or are able to swim back to the stream when ditches are shut down, but many others become stranded and die. Fish screens are uncommon in the area due to their high cost and need for maintenance, troubles with functionality, and overall lack of acceptance by the ranching community. Other alternatives to fish screens are being explored.

Numerous irrigation diversions in the Clarks Fork of the Yellowstone serve as barriers to upstream passage of certain fish species, particularly burbot. Lack of fish passage and low water appear to have impacted the burbot population in the Clarks Fork.

Overall, water quality is good in the upper Yellowstone. Whirling disease has been confirmed in rainbow and Yellowstone cutthroat trout in the middle portion of the drainage, but has not been found in the lower end, despite intensive testing.

## **FISHING ACCESS**

Almost 30 FASs are located on the Yellowstone River between Gardiner and Laurel. The majority of these sites are concentrated on the upper end of the river, where angler use is highest. There are also several additional sites available to the public that are not under FWP ownership or management. The area of the upper Yellowstone most lacking in fishing access is the reach between Columbus and Park City, approximately 20 river miles long. This reach has been a top priority for future access sites.

The Stillwater River has nine fishing access sites and supports very high recreational use, including commercial rafting operations, numerous angling and recreational floaters, bankangling, and camping. Only two FASs exist on the Boulder River, despite the river boasting a very high quality fishery. Much of the upper Boulder River flows through Forest Service land where there are a number of developed campgrounds and good public access. Four access sites are located on Rock Creek, but these are all grouped in a small area between Red Lodge and Roberts. Only one walk-in fishing access site exists on the Shields River.

East Rosebud Creek, West Rosebud Creek, Big Timber Creek, Sweet Grass Creek and other smaller streams have desirable fisheries but public access is primarily limited to county road crossings and a small number of public sites. Stream access via private land is becoming more difficult and therefore it will be critical to secure public access in these areas.



### **SPECIAL MANAGEMENT ISSUES**

Though angling use appears to be stable over the past decade or so, there has been a marked increase in the use of jet boats and rafts on the Yellowstone, and rafts on the Stillwater. In addition, angling pressure on the Yellowstone appears to be shifting downstream, with anglers from Bozeman and Livingston travelling greater distances to avoid crowds. Some concern has been raised over outfitters and guides who are not locally based beginning to operate farther downstream on the Yellowstone Stillwater rivers. Though overall use in the lower end of this reach of the Yellowstone drainage is relatively low, the apparent upward trend could become a management issue in the future.

PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

**FISHERIES MANAGEMENT DIRECTION FOR THE UPPER YELLOWSTONE RIVER DRAINAGE**

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Yellowstone River ( YNP to Springdale)	97 miles	Rainbow trout, Brown trout	Wild	Restrictive Regulations	Manage harvest to support quality and sustained angling opportunity. Maintain present numbers and sizes. Consider increasing angler harvest to reduce numbers if necessary to maintain fish growth.
		Yellowstone cutthroat trout (N)	Wild	Restrictive Regulations	Maintain catch and release fishery in order to maintain the current population.
		Mountain whitefish (N)	Wild	General	Maintain current populations.
Habitat needs and activities: Maintain current habitat					
Shields River and Tributaries (Upstream of Chadbourne Diversion)	54 miles in mainstem	Rainbow trout	Wild	Suppression	Remove where possible to prevent hybridization with Yellowstone cutthroat trout.
		Brown trout	Wild	General	Determine level of threat of brown trout to YCT. If needed reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted.
		Yellowstone cutthroat trout (N)	Wild	Conservation	Maintain catch and release fishery in order to maintain current populations. Implement project to protect and/or expand current populations.
		Mountain whitefish (N)	Wild	General	Maintain current populations.
		Brook trout	Wild	Suppression	Remove where possible to protect Yellowstone cutthroat trout.
Habitat needs and activities: Work to improve stream flow and water temperatures. Work slated to begin during the fall of 2012 to repair the Chadbourne Diversion and ensure that it is a fish barrier. Selective fish passage options are being pursued, but are dependent on negotiations with neighboring landowner.					

**PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN**

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Shields River and Tributaries (Downstream of Chadbourne Diversion)	11 miles in mainstem	Rainbow trout, Brown trout	Wild	General	Manage harvest to support quality and sustained angling opportunity. Maintain present numbers and sizes. Consider increasing angler harvest to reduce numbers if necessary to maintain fish growth.
		Yellowstone cutthroat trout (N)	Wild	Restrictive Regulations	Maintain catch and release fishery in order to maintain the current population.
		Mountain whitefish(N)	Wild	General	Maintain current populations.
Habitat needs and activities: Work to improve stream flow and water temperatures.					
Yellowstone River Tributaries (YNP to Springdale) Except Shields River	1,058 miles	Rainbow trout, Brown trout	Wild	General	Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted. Maintain sport fishery in other areas.
		Yellowstone cutthroat trout (N)	Wild	Restrictive Regulations	Maintain catch and release fishery in order to maintain the current populations.
		Mountain whitefish(N)	Wild	General	Maintain current populations.
		Brook trout	Wild	General	Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted. Maintain sport fishery in other areas.
Habitat needs and activities: Improve habitat (riparian, in-stream, and connectivity) and ensure stream flow in dewatered systems.					
Dailey Lake	206 acres	Yellowstone cutthroat trout (N) Rainbow trout	Hatchery/ Wild	Put-Grow-Take	Monitor recruitment to spring gill nets and adjust stocking as necessary in order to maintain size and age classes.
		Yellow perch	Wild	General	Monitor size and recruitment to spring gill nets.
		Walleye	Hatchery/ Wild	\Put-Grow-Take	Monitor recruitment to spring gill nets and adjust stocking as necessary in order to

PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
					maintain size and age classes.
Habitat needs and activities: Work to maintain adequate lake elevations and balance trout and warm water fisheries through stocking plans.					
Yellowstone River (Springdale to Clarks Fork)	95 miles	Rainbow trout, Brown trout	Wild	Restrictive Regulations	Manage harvest to support quality angling opportunity.
		Yellowstone cutthroat trout (N)	Wild	Restrictive Regulations	Maintain catch and release fishery in order to maintain the current population.
		Mountain Whitefish(N)	Wild	General	Maintain numbers. Attempt to better monitor population abundance, trends and angler harvest.
		Burbot (N)	Wild	General	Maintain numbers. Learn more about population abundance, distribution and habitat use. Attempt to enhance population and manage for limited harvest.
Habitat needs and activities: Improve habitat to support ecosystem function and fish production.					
Boulder River and Tributaries	65 miles in mainstem and 168 miles in tributaries	Rainbow trout	Wild	Restrictive Regulations	Downstream from Hells Canyon: manage harvest to support high quality angling opportunity. Upstream from Hells Canyon: reduce numbers to benefit Yellowstone cutthroat trout
		Brown trout	Wild	Restrictive Regulations	Manage harvest to support high quality angling opportunity
		Yellowstone cutthroat trout (N)	Wild	General	Allow harvest as part of Combined Trout limit for this drainage. Protect populations via habitat projects and removal of nonnatives where opportunities exist. Consider establishing new populations where opportunities exist. Manage for large, interconnected genetically pure population

**PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN**

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Mountain Whitefish(N)	Wild	General	upstream of waterfall barrier near Hells Canyon.
		Brook trout	Wild	Liberal Regulations/ Suppression	Maintain numbers
					Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted. Manage for sport fishery with opportunity for high levels of harvest in other areas.
Habitat needs and activities: Reduce entrainment of trout in irrigation ditches. Protect existing trout spawning habitat.					
Stillwater River and Tributaries	70 miles in mainstem and 451 miles in tributaries	Rainbow trout, Brown trout	Wild	Restrictive Regulations	Manage harvest to support high quality angling opportunity. Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted
		Yellowstone cutthroat trout (N)	Wild	Liberal Regulations/ Conservation	Allow harvest as part of Combined Trout limit for this drainage. Protect populations via habitat projects and removal of nonnatives where opportunities exist. Consider establishing new populations where opportunities exist.
		Mountain Whitefish (N)	Wild	General	Maintain numbers
		Brook trout	Wild	General/Suppression	Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted. Manage for sport fishery with opportunity for high levels of harvest in other areas.
Habitat needs and activities: Reduce entrainment of trout in irrigation ditches. Protect existing trout spawning habitat.					
Clarks Fork and Tributaries (except Rock	141 miles in mainstem and 229	Rainbow trout, Brown trout	Wild	Wild	Manage harvest to support quality angling opportunity

PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Creek)	miles in tributaries	Yellowstone cutthroat trout (N)	Wild	General	Allow harvest as part of District-wide Combined trout limit. Consider establishing new populations where opportunities exist.
		Mountain Whitefish(N)	Wild	General	Maintain numbers. Attempt to better monitor population abundance, trends and angler harvest.
		Brook trout	Wild	General	Manage for sport fishery with opportunity for high level of harvest.
		Burbot(N)	Wild	General	Maintain numbers. Learn more about population abundance, distribution and habitat use.
		Arctic grayling	Wild	General	Maintain numbers. Search for evidence of self-sustaining population in upper tributary reaches.
Habitat needs and activities: Improve fish passage over irrigation diversion dams. Minimize dewatering of lower reaches during drought years. Improve burbot habitat.					
Rock Creek and Tributaries	59 miles in mainstem and 274 miles in tributaries	Rainbow trout, Brown trout	Wild	Wild	Manage harvest to support high quality angling opportunity. Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted
		Yellowstone cutthroat trout (N)	Wild	Conservation	Allow harvest as part of District-wide Combined Trout limit. Protect populations via habitat projects and removal of nonnatives where opportunities exist. Indigenous populations should take top priority. Consider establishing new populations where opportunities exist.
		Brook trout	Wild	General/Suppression	Reduce numbers where Yellowstone cutthroat trout are potentially impacted. Manage for



PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
					sport fishery in other areas.
Habitat needs and activities: Reduce entrainment of trout in irrigation ditches. Protect existing trout spawning and rearing habitat. Minimize large scale human-caused stream channel alterations. Minimize dewatering of certain stream reaches during drought years.					
Cooney Reservoir	733 acres	Rainbow trout	Hatchery	Put-Grow-Take	Evaluate stocking and harvest regulations to optimize number stocked, size of fish and angler catch rate throughout the year.
		Walleye	Wild/ Hatchery	Put-Grow-Take	Continue monitoring to ensure adequate natural reproduction to support fishery. Stock if natural reproduction is inadequate. Maintain balance between walleye numbers and forage base.
		Burbot (N)	Wild	General	Consider adjusting harvest regulations to improve fishery. Manage harvest to support quality angling opportunity and maintain forage base. Continue monitoring population as it continues to become established.
		Brown trout	Wild	Wild/General	Maintain numbers.
		Yellow perch, black crappie	Wild	Wild/General	Maintain numbers. Continue monitoring. Consider habitat improvement projects if increase in numbers is deemed beneficial.
Habitat needs and activities: Explore adding shoreline/shallow water habitat structures to improve survival of forage fish, sport fish and crayfish.					
Yellowstone River Tributaries (Springdale to Clarks Fork) Except Stillwater, Boulder, Clarks Fork	540 miles	Rainbow trout, Brown trout	Wild	General	Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted. Maintain sport fishery in other areas.
		Yellowstone cutthroat trout (N)	Wild	General	Allow harvest as part of District-wide Combined Trout limit. Protect populations via habitat projects and removal of nonnatives where opportunities exist. Consider establishing new

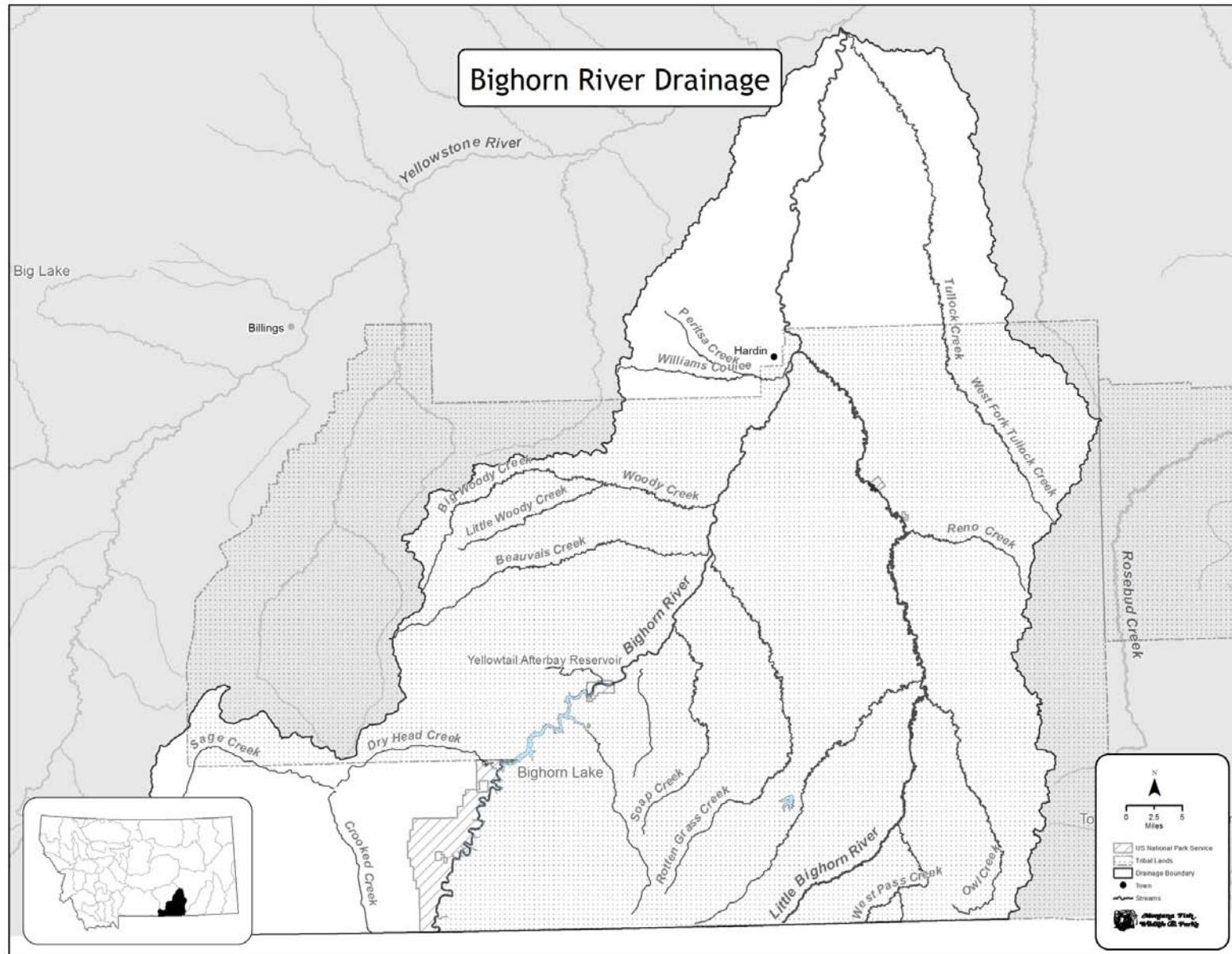
PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Mountain Whitefish(N)	Wild	General	populations where opportunities exist.  Maintain numbers.
		Brook trout	Wild	General	Reduce numbers/prevent invasion where Yellowstone cutthroat trout are potentially impacted. Manage for sport fishery with opportunity for high levels of harvest in other areas.
Habitat needs and activities: Improve habitat to support ecosystem function and fish production.					
Beartooth/Crazy Mountain Lakes	687 lakes and 9,318 acres	Yellowstone cutthroat trout (N)	Hatchery/ Wild	Put-Grow-Take	Maintain numbers. Monitor self-sustaining lakes to ensure population persistence. Continue stocking lakes currently stocked and managed for quality fish size quality. Adjust stocking rates as needed. Consider stocking in lakes containing rainbow and/or golden trout where genetic swamping would be consistent with YCT populations downstream in the drainage.
		Brook trout	Wild	General	Maintain numbers in most lakes. Reduce densities in lakes where it will benefit individual fish growth. Reduce numbers where YCT populations are potentially threatened.
		Rainbow trout	Wild	General	Reduce numbers and genetic contribution in drainages where YCT restoration is a priority.
		Golden trout	Hatchery/ Wild	Put-Grow-Take	Maintain numbers in most lakes through stocking and natural reproduction. Reduce numbers in areas where priority YCT populations are potentially threatened.
Continued on next page					

PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Arctic grayling	Hatchery/ Wild	Put-Grow-Take	Maintain numbers. Explore opportunities to provide angling opportunities in more lakes. Consider planting in lakes that contain other fish species to provide multi-species angling opportunity.
Habitat needs and activities: Explore adding spawning gravel to lakes where natural reproduction is desired.					
All waters	3,200 miles of stream	Nongame species (native and nonnative)	Wild	Conservation	Maintain connected populations, support ecosystem function.





## **BIGHORN RIVER DRAINAGE**

### **PHYSICAL DESCRIPTION**

The water source for the Bighorn River (and its major tributary the Little Bighorn River) begins in Wyoming in the Wind, Shoshone, and Bighorn mountain ranges before entering Montana, where it also receives water draining from the Bighorn Mountains as well as the Pryor Mountains. The Montana portion of the drainage includes a portion of the Shoshone River drainage which drains the south face of the Pryor Mountains (primarily the Sage Creek watershed) and flows into Wyoming, but in turn enters Bighorn Lake in Wyoming. Land ownership in this drainage includes private, Custer National Forest, the Crow Tribe Reservation, BLM, and State of Montana land.

Yellowtail Dam impounds the Bighorn River to form Bighorn Lake, which is the largest body of water in the watershed. This reservoir supports a popular recreational fishery that includes a diverse assemblage of native and nonnative species. Tributaries to the Bighorn River in Montana above the dam include Dry Head, Hoodoo, Pitchfork, Spring, Black Canyon, Big Bull Elk, Little Bull Elk, Porcupine, and Crooked creeks.

The lower Bighorn River begins at Yellowtail Dam, and enters the Yellowstone River 86 miles downstream. Tributary streams of the lower Bighorn River include the Little Bighorn River, Rotten Grass Creek, Soap Creek and War Man Creek. Currently, the Bighorn Canal captures the entire flow of War Man Creek within about one mile of its confluence with the river. Lime Kiln Creek is a small stream that enters the Bighorn River just below Yellowtail Dam. Grapevine Creek is an 8-mile long tributary of the Bighorn River that joins the river downstream of Yellowtail Dam.

### **FISHERIES MANAGEMENT**

The Crow Reservation covers a large portion of this drainage. Within the Reservation boundary, the State of Montana has the authority to manage Bighorn Reservoir, Afterbay Dam, and the Bighorn River proper. The Crow Tribe is responsible for management of all other waters within the reservation boundary. Management of tribal waters is not described in this document, except to reference a Memorandum of Understanding that the Crow tribe, several federal agencies and FWP signed, agreeing to work together to restore Yellowstone cutthroat trout populations in the Bighorn and Pryor mountain ranges.

Completion of Yellowtail Dam altered the fisheries potential of the Bighorn River. Historically, this river supported a warmwater assemblage of riverine species. The hypolimnetic release of cold, clear, nutrient-rich water now supports a world-class tailwater fishery for rainbow and brown trout. The Bighorn River rainbow and brown trout fishery is found from Fort Smith to Hardin. The Bighorn River fishery downstream of Hardin transitions into smallmouth bass, walleye, sauger, burbot, and channel catfish fishing. Bighorn Reservoir, created by Yellowtail Dam, provides substantial fishing opportunity for smallmouth bass, walleye, sauger, perch, crappie, brown trout, rainbow trout, and burbot. Mountain streams in the Bighorn and Pryor mountains provide fishing opportunity for cutthroat trout, rainbow trout, brown trout and brook



trout. Smaller streams in this reach under FWP management are essentially warm water prairie streams that provide habitat for native minnow communities.

Walleye and sauger management changes are being experimentally implemented in Bighorn Reservoir because of a genetically unique population of sauger in the Wyoming portion of the Bighorn River. In an effort to reduce potential hybridization between these sauger and walleye, and to demonstrate commitment to sauger preservation and restoration, FWP initiated stocking sterile walleye (with greater than 90% triploidy) into the reservoir. Additionally, sauger are being spawned in Wyoming and reared at Miles City State Fish Hatchery to be stocked in the lower portion of the Bighorn Reservoir in an attempt to increase abundance of sauger and improve angler catch rates and satisfaction.

Crooked Creek and Piney Creek contain the last aboriginal Yellowstone cutthroat trout in areas managed by FWP in the Pryor Mountains. A few populations of cutthroat can also be found in the Pryor and Bighorn Mountains within the Crow Reservation. A memorandum of understanding is in place with the Crow Tribe, BLM, USFS, USFWS, and FWP to recover cutthroat and to assist each other when possible for restoration projects. Sage Creek was a recent cooperative interagency project where brook trout and rainbow trout were removed and replaced with cutthroat. Currently the agencies and the Crow Tribe are in the process of confirming that this project was completed successfully. This fishery will be managed as a recreational fishery with harvest allowed.

The Bighorn River drainage falls under the Central District fishing regulations. Bighorn Reservoir regulations are developed cooperatively between FWP and the Wyoming Game and Fish Department. This cooperation helps to keep the regulations similar in both states for the same water body. Regulations differ from the Central District standards for bass, shovelnose sturgeon, sauger, walleye, catfish, and ling in Bighorn Reservoir. The Bighorn River regulations have specific sauger regulations that differ from the standard regulation. Other regulation exceptions include Crooked Creek and Piney Creek, which allow catch and release for cutthroat trout only. Cutthroat in Crooked Creek and Piney Creek are aboriginal, and efforts have been made to maintain and improve these conservation populations of cutthroat. The stream and river fisheries in Pryor Creek, Sage Creek, and Bighorn River are open all year.

## **HABITAT**

The Bighorn River has been the center of water management disputes between Wyoming and Montana stakeholders for nearly a decade. Criteria for water releases from the dam were developed to support the trout fishery downstream in the Bighorn River, and recommendations for reservoir elevations were advocated by the National Park Service and the State of Wyoming. New operating criteria were developed using computer models to improve transparency of water management by the BOR and to better understand hydrologic limitations imposed by varying water supply, reservoir storage, and dam discharge. Operational rules set reservoir drawdown and refill targets based on the shape and volume of inflows, and scheduled dam discharges to balance the often conflicting requirements for fish and recreation in the reservoir and river downstream. Rule curves were designed to reduce reservoir drawdown and improve refill, and optimize river flows (reduce duration of low flows and duration and magnitude of high flows) to benefit the fisheries in the Bighorn River downstream of the dam. It is not possible to prevent all

extreme high or low water conditions in either the river or reservoir because of forecasting error and natural variability in annual water supply from snow melt and unpredictable rainfall events.

Side channel habitat in the Bighorn River has been declining since the dam was put in place in 1967 due to lack of high spring flows and sedimentation. A study by the BOR determined the river bed was not substantially degrading, and the side channels were essentially being plugged with sediment at the heads of the channels with subsequent vegetation growth holding the sediment in place. Some channel heads have been identified for excavation with one completed in 2012.

Several habitat projects have been completed recently in tributary systems. A fish barrier to prevent brown trout from occupying Yellowstone cutthroat habitat and range was put in place in Crooked Creek in 2008. A small private irrigation reservoir on Piney Creek was improved by restoring volume and altering water withdrawal from an open pipe to a kettle system, which reduced fish loss to irrigation as well as improved pool habitat. Additionally the BLM placed logs in Piney Creek to improve substrate and cover habitat. Efforts have been made to ensure culverts and other bank projects in Sage Creek are sized and placed properly to maintain fish passage in the upper watershed.

#### **FISHING ACCESS**

FWP manages seven FASs along the Bighorn River: Manuel Lisa, General Custer, Grant Marsh, Arapooish, Two Leggins, Mallards Landing, and Bighorn. Because of the popularity of the Bighorn River, additional FASs could improve access and reduce crowding. Two areas of particular interest would be to develop an additional access between Three Mile and Bighorn FASs, and to develop an access near the St. Xavier Bridge.

The Bighorn Canyon National Recreation Area managed by the National Park Service manages access for the river at Three Mile (Lind Access) and Afterbay Dam. Additionally the Park Service manages 2 boat ramps on Bighorn Reservoir at Ok-a-beh, and Barry's Landing in Montana as well as 1 boat ramp on the Afterbay Reservoir. Access is also available in Wyoming for Bighorn Reservoir at Horseshoe Bend. Several more remote access locations managed by the Forest Service and the BLM allow for access on many streams in this management area. Lodge Grass Reservoir provides opportunity for tribal and non-tribal members but it is managed by the Crow Tribe.

#### **SPECIAL MANAGEMENT ISSUES**

Fishing contests occur on Bighorn Reservoir for bass, walleye, and carp on. The Bighorn River supports an annual basis an extensive outfitting and guiding industry. The upper 13 miles on the Bighorn River is restricted to non-motorized boats to reduce conflicts between drift boaters and floaters and powered water craft. Several streams in this management area support conservation populations of Yellowstone Cutthroat.

PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

**FISHERIES MANAGEMENT DIRECTION FOR THE BIGHORN PRYOR RIVER DRAINAGE**

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Bighorn Reservoir (Yellowtail Reservoir)	17,300 acres	Sauger (N)	Wild, Hatchery	Put-Grow-Take/Conservation	Supplemental stocking on experimental basis 2013-2016 in lower reservoir as an effort to improve catch and harvest rates for anglers
		Walleye	Wild, Hatchery	Put-Grow-Take/Quality	Stock only 90%+ triploid fingerling in effort to reduce potential risk for hybridization with unique and pure sauger in the Upper Bighorn River. Provide opportunity to catch walleye with trophy opportunity.
		Smallmouth bass, Yellow perch, Crappie, Brown trout, Channel catfish (N) Burbot (N), Carp	Wild	General	Monitor populations over time; rely solely on natural reproduction.
		Rainbow trout	Hatchery	Put-Grow-Take	Monitor populations as necessary.
		Native suckers & minnows (N)	Wild	General	Monitor populations as necessary.
Habitat needs and activities: Make recommendations to BOR for lake elevation management, evaluate sauger and walleye stocking programs.					
Sage Creek	62 miles	Yellowstone cutthroat trout (N)	Wild	Conservation	Establish a fishable population under standard Central District fishing regulations following brook trout removal in 2010-2011.
		Long nose dace, Lake chub, Fathead minnow,	Wild	Conservation	Ensure these species re-establish following brook trout removal in 2010-2011
		Prairie fish assemblage (N)	Wild	General	Maintain populations. Evaluate feasibility of this becoming a source of certified live bait for

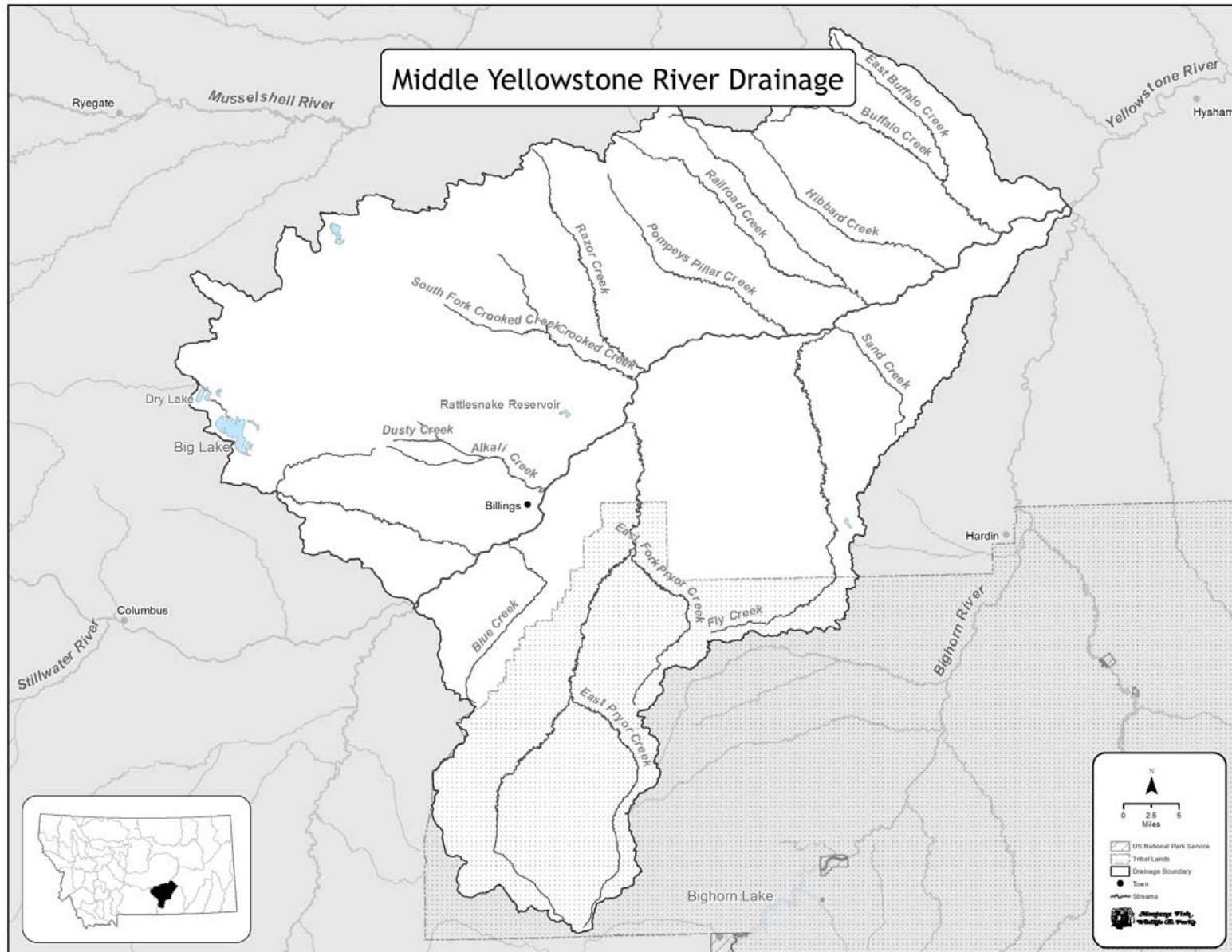
PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
					Bighorn Lake anglers.
Habitat needs and activities: Currently in the process of removing non-native trout and re-establishing cutthroat. Water goes sub-surface frequently once the creek reaches Bowler Flats, several in-channel dams provide refuge for minnow and sucker species, consider efforts to improve habitat. Sage Creek may need some habitat improvement for spawning areas as well as riparian fencing.					
Bighorn Reservoir tributaries (Piney Creek, Dry Head Creek Crooked Creek)	33 miles	Yellowstone cutthroat trout (N)	Wild	Conservation/ Restrictive Regulations	Aboriginal populations, no harvest allowed
		Brown trout (Crooked Creek below barrier)	Wild	General/Suppression	Consider reducing or eliminating this and other trout species in the reach from the barrier to the reservoir, and replacing with cutthroat. Most of the reach is in Wyoming and would require a coordinated effort.
Habitat needs and activities: Riparian protection needed as many areas in the Pryor Mountains are overgrazed; many road projects could jeopardize trout populations with perched culverts and increased erosion from road work. Barrier placed in Crooked Creek 2008 may need occasional repair, Habitat improvements in Piney Creek need to be maintained.					
Afterbay Reservoir	176 acres	Rainbow trout	Hatchery/ Wild	Put-Grow-Take	Stock in years when full drawdown isn't conducted. Drawdown is done every 3 years by BOR to evaluate seeps from dam.
Habitat needs and activities: this is a re-regulation reservoir with the potential for 15 vertical feet of elevation change daily, which is a limiting factor to do any substantial fishery management.					
Bighorn River - Downstream of Yellowtail Reservoir	84 miles	Sauger (N)	Wild	Conservation/Restrictive Regulations	Maintain reduced harvest limits, better understand genetic composition. Investigate opportunities for sauger population improvement in the lower river.
		Channel Catfish (N)	Wild	General	Manage as a recreational fishery.
		Burbot (N)	Wild	General	Evaluate population to determine status.
		Mountain Whitefish (N)	Wild	General	Manage as a recreational fishery.

PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Rainbow Trout, Brown Trout, Walleye, Smallmouth Bass	Wild	General	Manage as a recreational fishery.
		Native non-game species (N)	Wild	General	Improve documentation of abundance and distribution during standard and other sampling efforts.
Habitat needs and activities: Side channel restoration to maintain habitat diversity in the Bighorn to support a variety of fish sizes and species. Flow management activities will be required to ensure the fishery is provided adequate water to maintain the fishery. Gas super saturation in upper river is a recurring problem, look for ways to reduce the cause work with BOR and WAPA to reduce severity if possible. Increased bank stabilization work negatively influences riverine habitats, work with Conservation District and private landowners to find sustainable ways to protect the fishery and property.					
Arapooish Pond	27 acres	Largemouth bass	Hatchery	General/ Family Fishing water	Occasional re-stocking after winterkills
		Carp, Native suckers (N), Bullheads, Minnows	Wild	General	Fish from the Bighorn River were able to access the pond during flooding in 2011. May need to address in the future if bass are impacted.
Habitat needs and activities: Lake is supported with aeration system to reduce frequency of winterkill, but with more depth the need for air pumps could be eliminated.					







## **MIDDLE YELLOWSTONE RIVER DRAINAGE**

### **PHYSICAL DESCRIPTION**

This reach of the Yellowstone River begins at the confluence of the Clarks Fork of the Yellowstone River and the Yellowstone River just upstream of Billings, the largest city in Montana. It flows west to east approximately 86 river miles to Ranchers Ditch Diversion Dam which is located about 2.5 miles downstream of the mouth of the Bighorn River. Most of this reach is located in Yellowstone County with the lower 2.5 miles in Treasure County. This entire section of river flows through a wide valley with high sandstone bluffs bordering and confining the river on one side or the other through most of the reach. The dominant bluffs are on the south side of the river upstream of Billings and then switch to the north side the rest of the way down. The channel in this section of the Yellowstone is dominated by a cobble and gravel substrate with many islands and gravel bars. Where it can, the river channel is constantly moving within its flood plain. The railroad right-of-way borders the south side of the Yellowstone River along most of this reach, and in many places the railroad line forms the south bank of the river so the riverbank is heavily armored with large rip rap. The very upper end of this reach is highly urbanized between the cities of Laurel, Billings and Lockwood. As a result, much of the river bank in this section is armored and controlled with rip rap and dikes. A high percentage of the rip rap in this section is concrete rather than rock. Downstream of Lockwood, the river flows past the small towns of Huntley, Shepherd, Pompeys Pillar and Custer.

The Clarks Fork of the Yellowstone enters the Yellowstone River at the upper end of this reach. Two larger tributaries, Canyon Creek from the north, and Pryor Creek from the south enter the Yellowstone in the Billings area. A number of smaller tributary streams enter the Yellowstone from both sides of the valley throughout this section. The only major drainage that feeds into the Yellowstone in this section is the Bighorn River that flows in from the south about 2.5 miles upstream of the lower end of this reach.

The Yellowstone valley is dominated by agriculture growing sugar beets, grains, hay and cattle. As a result, the valley is laced with a network of large irrigation projects that divert a significant volume of water out of the river. Some of these irrigation projects can entrain large numbers of fish. Many of these irrigation systems are designed to use natural tributary streams as waste channels to return excess water back to the Yellowstone River when irrigation demands are lower. This operation can seriously impact flow patterns in these natural streams, cause serious erosion along these stream channels and transport different fish species unnaturally throughout the valley.

Two major low-head diversion dams are present in this section of the Yellowstone with a third structure at the very lower end of the reach. Huntley Diversion Dam is located about 27.4 river miles downstream from the upper end of this reach or about 10 miles east of Billings. It is a concrete-capped weir with a structural height of 10.5 feet and a hydraulic height of 8 feet. This dam spans the entire main channel of the Yellowstone and during normal flow conditions, is an almost complete fish passage barrier for most species of fish found in this section of the river. A seasonal side channel that bypasses the dam to the north side may provide some fish passage especially during higher flows. This side channel merges with the main channel about 3,650 feet

downstream of the dam so fish moving upstream that are blocked by Huntley Dam are unlikely to drop far enough downstream to find this passage around the dam. A fish passage structure was added to Huntley Dam in 1999-2000 when the dam was rebuilt after damage from high water in 1997. This passage was designed to provide passage for warmwater fish species found in this section of the Yellowstone, but the structure was not built as designed, and follow-up studies found that very few fish actually used the bypass structure. Plans are currently ongoing to redesign and rebuild this fish passage so it can pass warmwater fish.

Waco Diversion Dam is located 62.4 river miles downstream from the upper end of this reach. It is another concrete-capped weir that spans the main river channel. It is not as high as Huntley Dam, but still causes a serious high velocity drop off the face of the dam during normal flow conditions, and is likely a fish barrier to most species in the area. Waco Dam has a more developed bypass channel around the dam to the north. This channel maintains better flows during lower water periods than the bypass around Huntley Dam and the downstream connection of the bypass channel to the main channel is closer to the dams so this channel may provide better fish passage than the Huntley bypass channel.

Ranchers Ditch Diversion is located at the downstream boundary of this reach. This diversion consists of two structures spanning both channels at the top of an island. The diversion in the smaller south channel consists of a concrete-capped rubble weir with a well defined dam crest yielding a nearly vertical plunging flow. This structure presents major fish passage issues. The structure on the larger north channel consists of a concrete and rock cap placed over an old steel piling and brush bundle dam. Flow over this section of the diversion is more irregular with a less distinct drop and greater slope. Because flow over the north dam is more like a flow over a steep riffle this section of the dam is probably less of a fish passage barrier than the other diversions in this reach. The irrigation company is constantly working on the north dam, and recent plans to rebuild part of this diversion could increase fish passage issues.

## **FISHERIES MANAGEMENT**

The upper end of this reach on the Yellowstone River represents the transition zone from a coldwater, trout dominated stream to a warmwater stream. Trout numbers drop off rapidly in the upper 27 miles of this reach as cool and warmwater fish numbers increase. The free flowing nature of the Yellowstone River, the natural hydrograph and fairly natural habitat conditions allows the Yellowstone to support and maintain a wide diversity of native and introduced fish species. This reach of the Yellowstone supports approximately 40 different fish species including 28 native species. As a result, this section of the Yellowstone is managed with an emphasis on maintaining the diverse native fishery of both game and nongame species.

The entire reach is managed to provide a diverse recreational fishery for both native and introduced fish with regulations designed to help protect native populations while promoting harvest on nonnative predatory species that can impact native populations. The entire Yellowstone River is managed as a wild fishery with no routine stocking occurring on any section of the river. The upper end of this reach still supports a fairly good rainbow, brown trout and mountain whitefish fishery. As the river transitions into a warmwater fishery below Huntley Dam emphasis shifts to native channel catfish, sauger, and burbot and nonnative smallmouth bass and walleye. Other game species that occasionally show up in this fishery include northern

pike, largemouth bass and crappie. Some nongame species such as goldeye also provide popular angling opportunities.

Restrictive regulations only allowing the harvest of one sauger per day, with a possession limit of two sauger, is designed to protect the limited and genetically unique sauger population in this reach. Cartersville Dam near Forsyth, about 59 miles downstream of this reach has been shown to be a significant barrier to upstream fish movement with a noticeable reduction in sauger numbers and almost total elimination of some species like shovelnose sturgeon upstream of the dam. Channel catfish limits have been reduced statewide to provide additional protection to this long-lived native game fish. All other game species in this reach are managed under standard Central and Eastern district limits. Angling is open year-round on this section of the Yellowstone River although river ice can severely limit the winter fishery most years. Historically, bank fishermen have been the main anglers on this section of the Yellowstone River; but in recent years more and more anglers are using jet boats, which has significantly increased angler use during the spring, summer and fall seasons.

Another important management concern in this section of the Yellowstone River is protection and enhancement of populations of smaller native fishes including numerous minnow and sucker species. These smaller fish provide the main forage base necessary to maintain the populations of larger game fish in the river. In addition, these nongame species are an important part of the diverse native fish fauna that fulfill an ecological role important to the native species management aspect of the middle Yellowstone River.

The majority of tributary streams that feed this reach of the Yellowstone River are smaller prairie streams that provide limited or no recreational angling opportunities. Many of these streams are important to the different life history stages of the various native fish populations in this reach. The Bighorn River is the only major tributary that flows into this reach of the Yellowstone. It enters the Yellowstone approximately 2.5 miles upstream from the lower end of this reach. The Bighorn River is managed as a recreational tailwater trout fishery in the upper end below Yellowtail Dam and transitions into a warmwater fishery before it enters the Yellowstone River.

Several smaller lakes, ponds, and reservoirs including Lake Elmo, Lake Josephine, Laurel Pond and Anita Reservoir, and private ponds with agreements to allow some public access, provide important urban fisheries in the Billings area. These waters are stocked annually with trout as put-and-take fisheries or with largemouth bass, as needed, as put-grow-and-take fisheries. Being close to the largest population center in the state, these waters receive considerable angler use. Good creel data is lacking and needed for these waters. Water levels in some of these lakes are impacted by irrigation demands so it is important to maintain a good working relationship with the associated irrigation districts.

## **HABITAT**

The upper end of this reach represents a transition zone from a relatively clear, coldwater stream to a more turbid warmwater stream. The Clarks Fork drainage at the top of the reach adds considerable sediment to the Yellowstone from early spring runoff until late fall. As the river flows through the city of Billings, heated water from industrial discharges warms up the water temperatures enough that a section of river downstream of town remains ice free throughout the winter except during the most extreme conditions. All of the tributaries that enter this section of

the Yellowstone add turbidity to the river and this turbidity increases during the irrigation season when the different tributaries are flushed with excess water out of the various irrigation ditches. Water temperatures in the upper reach above Billings can reach the mid-70° F range during low water years, while temperatures in the lower end of the reach above the Bighorn River can get into the mid- to high 80s. Flows at the USGS gage at Billings have ranged from a low of 15,200 cfs on May 10, 1934 to a high of 82,000 cfs on June 12, 1997.

This section of the Yellowstone can be affected by the FWP Drought Fishing Closure Policy that requires priority waters, such as the Yellowstone River, be closed to angling if flow or temperature thresholds are reached. Because this section of river represents the transition from cold to warm water habitat on the Yellowstone, past drought closures have normally only extended downstream to the upper end of the warmwater section at Huntley Dam,.

The channel in this reach of the Yellowstone is dominated by boulder and cobble substrate with sediment and sand deposits in slower sections. Where the river isn't controlled by natural bluffs, railroad rip rap, or other man caused bank armoring, it moves fairly naturally within its normal flood plain. River channels are constantly moving and shifting by eroding and laying down new gravel and point bars. Except in the highly urbanized upper section, the riparian zone along this section of the Yellowstone is in fair condition with good cottonwood and willow bottoms. Some agricultural activities extend right to the river's edge, and both Russian olive and salt cedar (noxious weeds) invasions present serious threats to the riparian zone along this entire reach.

Huntley Dam and Waco Dam within the reach, and Ranchers Ditch Diversion at the lower end of the reach, all present fish passage and boat passage issues. These diversions, along with a number of other pump and gravity feed irrigation systems can seriously impact instream flows along this section of the river, and all of them can cause fish loss due to entrainment. FWP has reserved water rights for instream flow with a 1978 priority date on the Yellowstone River. At Billings these reserved rights range from winter flows of 2,483 cfs in January to spring runoff flows of 18,716 cfs in late June. Reserved rights at Billings for the summer and fall irrigation season range between about 3,100 and 4,000 cfs. During low water years, river flows drop below these reservation rights and FWP places calls on water users with rights junior to the FWP 1978 priority date.

## **FISHING ACCESS**

FWP manages seven FASs along this reach of the Yellowstone River and another site one mile up the Bighorn River that provides boat access to the lower end of this reach. Five of these sites are day use only, while three of them offer overnight camping. A large wildlife management area and associated BLM land located on the north side of the river near the town of Pompeys Pillar provide walk-in access to over five miles of river frontage. Several other publicly owned or managed access points along this section of the Yellowstone provide river access and access for carry-in type boats. Only one of these sites, a county park near Billings, has an actual boat ramp.

Reliable motor boat access is an ongoing concern in this section of the Yellowstone River due to the natural, free flowing nature of the river. Jet boaters are an important and growing user group on this section of river. The constant movement of the river within its flood plain, and the continuing movement and shifting of gravel bars along the river, which help make the river such a unique and important fishery resource, also make it very difficult to maintain permanent motor

boat access along the river. Motor boat use, especially during lower flows, is currently difficult or impossible at several of the existing access sites along this reach, and access changes after each high water event. The highest priorities for new access along this reach would be just up- and downstream of Huntley Dam. In the past it has been possible to boat around Waco Dam through the north bypass channel during most flow conditions. Recent changes in this bypass channel could eliminate boat passage except during high water. Without reliable jet boat passage, additional access above and below Waco Dam would become a high priority. Any potential new access in a relatively stable section of river that can provide reliable ramp access to the river should be considered a high priority.

### **SPECIAL MANAGEMENT ISSUES**

There are several special management issues associated with this section of the Yellowstone River with the most prominent issue being that of native species management. Recent genetic research has shown that the sauger population in this section of the river is genetically unique from any other sauger populations in the remainder of the Yellowstone, Bighorn, or Missouri river drainages in Montana or Wyoming. Additional work is needed to learn more about this sauger population and identify steps necessary to maintain its unique characteristics. Smallmouth bass numbers have greatly increased in this section of the river in recent years. Although they provide a very popular fishery, the impacts this new predator base is having on the native fish populations in the river is poorly understood and needs additional study. Walleye numbers also appear to be increasing in this reach, and their impacts, both as an added predator and their potential hybridization with sauger could impact native fish populations.

The impacts of commercial bait seining on native minnow populations along this section of the Yellowstone River is another major concern. The Yellowstone drainage has become the main source of minnows for a majority of the commercial bait operations throughout eastern Montana. Seiners come from all over eastern Montana to seine the river and tributaries along this reach of the Yellowstone, and this pressure could continue to increase as areas in northeast Montana are closed to seining due to the presence of Eurasian watermilfoil. This seining pressure, especially when combined with increased predation from smallmouth bass and walleye, could have serious impacts on native minnow and sucker populations. Reduction in numbers of these species could seriously impact the native game species that rely on them as forage.

**FISHERIES MANAGEMENT DIRECTION FOR MIDDLE YELLOWSTONE RIVER DRAINAGE**

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Yellowstone River ( Confluence of Clarks Fork of the Yellowstone River to Ranchers Ditch Diversion)	86.1 miles	Rainbow trout, Brown trout, Mountain whitefish(N)	Wild	General	Manage as a recreational fishery allowing for limited harvest with standard regulations
		Sauger(N)	Wild	Conservation/ Restrictive Regulations	Manage sauger populations for limited consumptive harvest with harvest restrictions upstream of Cartersville Dam. Conduct studies to evaluate the importance of the unique genetic character of the sauger population in this section of the Yellowstone. Identify spawning areas and migratory patterns that have helped maintain this genetic uniqueness. Determine value and importance of improving or restricting fish passage in the lower Yellowstone to maintaining this genetically unique population.
		Burbot (N)	Wild	General	Attempt to enhance this burbot population and manage for limited harvest. Identify factors limiting the burbot population in this section of the Yellowstone.
		Channel catfish (N)	Wild	General	Manage as a recreational fishery with emphasis on maintaining a diverse population structure, while providing opportunities to catch larger catfish. Standardize catfish sampling as much as possible in Eastern Montana. Evaluate impacts of recent regulation changes on catfish populations.
		Smallmouth bass	Wild	General	Manage as a recreational fishery with emphasis

**PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN**

<b>Water</b>	<b>Miles/acres</b>	<b>Species</b>	<b>Recruitment Source</b>	<b>Management Type</b>	<b>Management Direction</b>
		Walleye	Wild	General	on harvest. Conduct a study to evaluate the impacts of smallmouth bass on native fish populations in the Yellowstone River.
		Native nongame species(N)	Wild	Conservation	Manage as a recreational fishery with emphasis on harvest.  Manage commercial minnow harvest to protect native fish populations. Conduct studies to evaluate and determine habitat and flow needs for native fishes. Work with other permitting agencies to limit impacts of habitat change along the Yellowstone River.
Habitat needs and activities: Improve fish passage for warmwater species at all diversion dams from Intake Dam upstream. Reduce entrainment and loss at head gates and pumps. Maintain or improve instream flows in the river and tributaries. Manage habitat projects to maintain the natural stream functions of a wild undammed river, and evaluate habitat projects based on cumulative impacts.					
Pryor Creek (Downstream of Crow Reservation Boundary)	16.1 miles	Multiple species	Wild	General	Evaluate and improve fish passage issues upstream of the Yellowstone River. Monitor fish movement in and out of the Yellowstone River, monitor spawning success of game and nongame species, and monitor the establishment of resident fish populations in Pryor Creek. Manage Pryor Creek to provide a continuing source of young game fish and forage to the Yellowstone River.
Habitat needs and activities: Improve upstream fish passage now that Pryor Creek has been reconnected with the Yellowstone River. Improve summer stream flows and improve habitat to support ecosystem function and production of native species.					
Yellowstone Tributaries (Smaller Prairies Stream)	42 streams and 290 miles	Multiple native species (N)	Wild	Conservation	Manage commercial minnow harvest to protect native fish populations.
Habitat needs and activities: Evaluate barriers in each tributary and improve fish passage and connectivity with the Yellowstone River. Improve habitat to support ecosystem function and production of native species.					

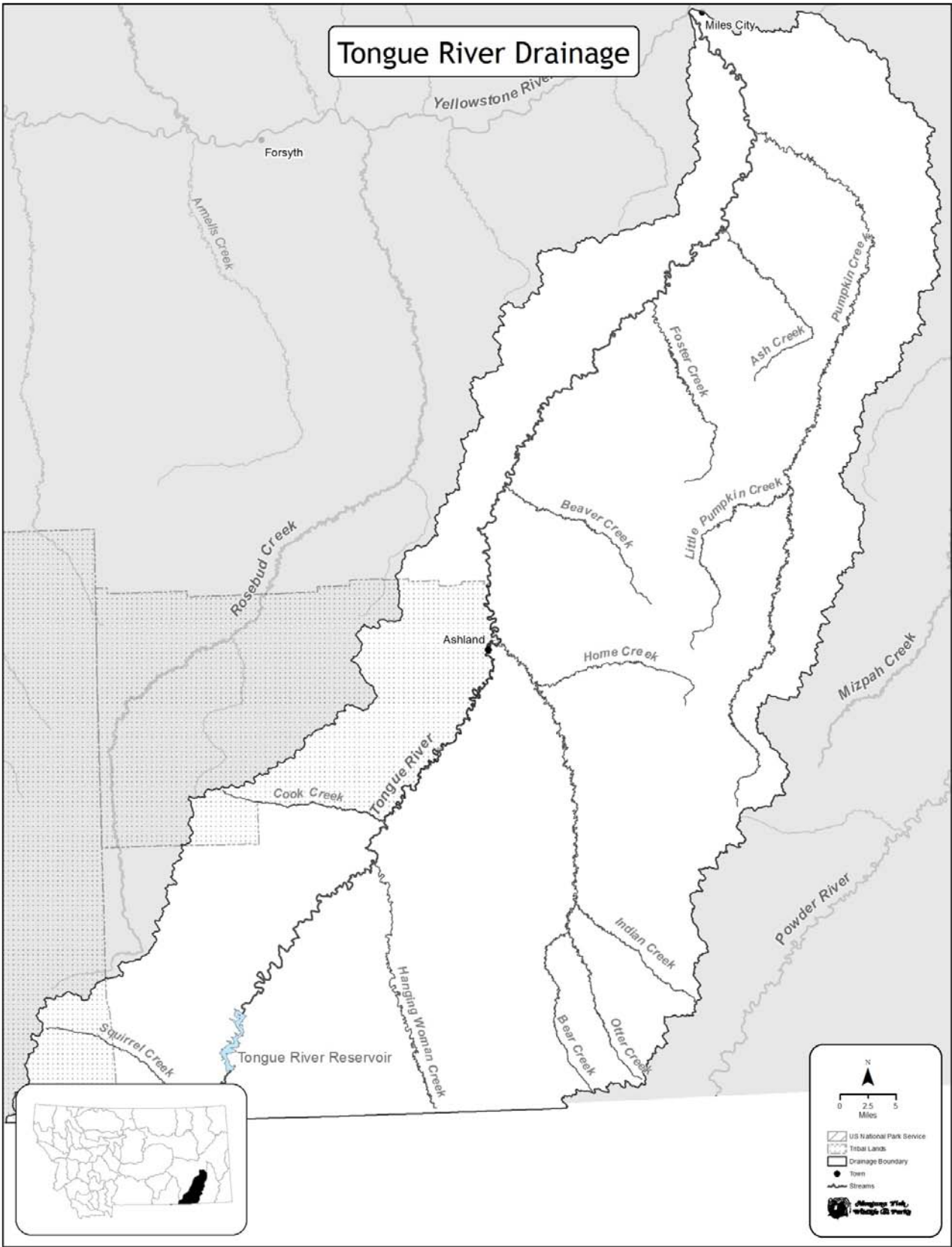


**PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN**

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Lake Elmo	65 acres	Rainbow trout, Yellowstone cutthroat trout (N)	Hatchery	Put-Take/ Family Fishing water	Manage for maximum recreational use with emphasis on harvest. Adjust stocking rates to provide high catch rates on trout while maintaining reasonable growth rates on stocked fish. Stock with surplus brood fish to support kid’s fishing events.
		Tiger muskie	Hatchery	Quality	Stock a limited number of fish on a 4 year rotation to maintain predation pressure on the sucker population in the lake while providing anglers the opportunity to catch a trophy sized fish.
		Channel catfish(N)	Hatchery	Put-Grow-Take	Stock annually if fish are available to provide an additional opportunity for anglers fishing this popular urban fishery.
Habitat needs and activities: Work with Billings Heights Water on water management for the lake. Limit water level fluctuation during the weekends and ensure the lake is full before the ditch is shut off in the fall. Develop long-term lake management plan to improve fisheries habitat in the lake.					
Lake Josephine	20 acres	Largemouth bass	Hatchery/ Wild	General/ Family Fishing water	Stock every other year to supplement natural reproduction. Promote voluntary catch-and-release on 12 to 15 inch bass.
		Tiger muskie	Hatchery	Quality	Stock a limited number of fish on a 4 year rotation to maintain predation pressure on the sucker population in the lake while providing anglers the opportunity to catch a trophy sized fish.
		Channel catfish (N)	Hatchery	General	Stock annually if fish are available to provide an additional opportunity for anglers fishing this popular urban fishery.

**PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN**

<b>Water</b>	<b>Miles/acres</b>	<b>Species</b>	<b>Recruitment Source</b>	<b>Management Type</b>	<b>Management Direction</b>
Laurel Pond	18 acres	Rainbow trout, Yellowstone cutthroat trout (N)	Hatchery	Put-Take/ Family Fishing water	Manage for maximum recreational use. Adjust stocking rates to provide high catch rates on trout while maintaining reasonable growth rates on stocked fish. Stock with surplus brood fish to support kid's fishing events.
Habitat needs and activities: Maintain windmills for aeration.					
Anita Reservoir	30 acres	Largemouth bass	Hatchery	General/ Family Fishing water	Stock as necessary to maintain a recreational fishery
Habitat needs and activities: Coordinate with the Huntley Irrigation District to improve long-term water management to benefit the fishery.					



## **TONGUE RIVER DRAINAGE**

### **PHYSICAL DESCRIPTION**

The Tongue River Drainage includes the Tongue River, Hanging Woman Creek, Otter Creek, Pumpkin Creek, Tongue River Reservoir, and numerous stock ponds and prairie streams. Land ownership in the district is mostly private and agriculture is the primary land use practice in the Tongue River watershed with 67,000 acres of irrigated land supporting cattle ranching and farming operations. The Fort Union Coal Formation underlies the watershed. The Tongue River originates on the eastern side of the Big Horn Mountains in north-central Wyoming (Sheridan County) and flows north through Southeast Montana (Big Horn, Rosebud, and Custer counties) to the Yellowstone River. The Tongue River has a drainage area of 5,379 mi<sup>2</sup>, approximately 70% occurring in Montana and 30% in Wyoming. The total length of river in Montana from the state line to its confluence with the Yellowstone River, near Miles City, is 209 miles.

At Decker, Montana, near the Wyoming/Montana border, Tongue River Dam (river mile 189) creates Tongue River Reservoir, a main stem reservoir that can store 79,071 acre-feet of water. In Montana the Tongue River has been divided into five segments by four dams. There are three irrigation diversion dams: (1) Tongue and Yellowstone (T&Y) Diversion Dam at river mile 20; (2) SH Diversion Dam, which is no longer in existence (river mile 51); and (3) Mobley Diversion Dam, which is mostly gone and does not restrict fish passage (river mile 105); and one flood control dam, Tongue River Dam (river mile 189). There is a thermally unique sixth river segment created by hypolimnetic releases out of Tongue River Reservoir. This cold water segment is approximately ten river miles long and ends downstream of the dam near the Rosebud/Big Horn County line (river mile 179).

No natural lakes are found within the drainage. There are, however, numerous stock ponds and some are managed as fisheries with public access and are stocked by FWP. For the rivers and streams, Hanging Woman Creek, Otter Creek, and Pumpkin Creek have game fish that include native and introduced species.

### **FISH MANAGEMENT**

The Tongue River and its tributaries are home to many warmwater and a few coldwater fish species. Native fish species include; sauger, shovelnose sturgeon, channel catfish, burbot, freshwater drum, goldeye, smallmouth buffalo, bigmouth buffalo, blue sucker, river carpsucker, shorthead redhorse sucker, white sucker, longnose sucker, longnose dace, creek chub, lake chub, brassy minnow, fathead minnow, sturgeon chub, flathead chub, western silvery minnow, sand shiner, emerald shiner, and stonecat. Common carp, plains killifish, black bullhead, yellow bullhead, and green sunfish are introduced species that can be found in parts or all of the Tongue River drainage. Largemouth bass, smallmouth bass, walleye, white crappie, black crappie, northern pike, yellow perch, rock bass, pumpkinseed, and spottail shiner have been stocked or illegally introduced in Tongue River Reservoir. Brown and rainbow trout have been stocked in the Tongue River in the tail water below Tongue River Dam.

Trend electrofishing is conducted on six reaches of the Tongue River each year to assess the current relative abundance, population structure, and body condition of fish populations in the Tongue River and monitor changes over time. Trend sampling on Tongue River Reservoir includes gillnet, trap net, and seining methods and is conducted to assess catch rates, condition, and length frequency of game fish in the reservoir. Stock ponds are sampled at least every three years to evaluate the status of the fisheries and ensure a catchable stock of fish is present.

A variety of fish species are available for stocking into ponds and the Tongue River Reservoir from FWP hatcheries including walleye, rainbow trout, smallmouth bass, and largemouth bass. Catchable size trout are stocked annually in the coldwater stretch of the Tongue River below Tongue River Reservoir. The statewide wild fish transfer policy allows regional staff to transfer a variety of species from source ponds with good populations to receiving ponds with fisheries that have suffered due to winterkill or drought. Species stocked in this way include northern pike, yellow perch, black crappie, white crappie, and bluegill.

The Tongue River drainage offers many public ponds and private ponds with public access that are managed as a fishery in the Regional Pond Fishing Program. The primary justification for stocking these waters is providing a family fishing opportunity. The program is offered to landowners as a public relations opportunity to provide a fishery for the surrounding community. As long as the landowner allows free public access to the pond FWP will stock and manage the fishery. Anglers are required to obtain landowner permission each time they want to access the fishery. Rainbow trout, largemouth bass, yellow perch, northern pike and crappie dominate the species available in these systems. The fisheries are inspected at least once every three years to examine population densities and size structures. Populations are established or supplemented when needed through stocking from a state hatchery or by wild fish transfers from another fishery within the region.

There is a reduced limit on sauger in the Tongue River above the reservoir to help preserve a remnant population while still allowing for some consumptive harvest. Overall fishing pressure is relatively low on the Tongue River due in large part to lack of public access to the river. Twelve Mile Fishing Access Site (river mile 20) is one of the few publically accessible sites on the Tongue River and is a popular destination for local and out of state anglers. Due to crowding issues at Twelve Mile FAS there is a special regulation limiting the number of lines an individual angler can fish. Stock ponds and prairie streams in the Tongue River drainage have fairly low angling pressure. Tongue River Reservoir ranks 30<sup>th</sup> in the state and 1<sup>st</sup> in Region 7 for angler pressure. Due to congestion during holiday weekends, weekend fishing tournaments at Tongue River Reservoir are restricted from the week before and after the following weekends: Memorial Day, Fathers Day, Fourth of July, and Labor Day.

## **HABITAT**

The Tongue River has a constrained riparian corridor with much of the floodplain developed for irrigated agriculture. The river above and below the reservoir has more rocky substrates than downstream reaches and is influenced directly by development of the area's coal resources, a major industry in the watershed. Numerous sites in the Tongue River watershed have been permitted for the development of coal bed methane extraction. The extraction of coal bed methane involves pumping methane and groundwater from coal seams. Much of this water, that is high in salt, is discharged into the Tongue River above Tongue River Reservoir.

The upstream end of Tongue River Reservoir has abundant submerged woody vegetation as a result of the dam rebuild in 1998 that raised the water level of the reservoir. The upstream end has increased turbidity as a result of the river influence. The middle to lower end have abundant rocky habitats and increased water clarity. Submerged aquatic vegetation is common in the bays throughout the reservoir.

The approximately ten river miles downstream of the dam, is a thermally unique river segment created by hypolimnetic releases out of Tongue River Reservoir that supports a stocked rainbow trout and naturally-reproducing brown trout population. The Tongue River in the Birney and Brandenburg area is characterized by a dense cottonwood riparian corridor and has deeper holes that are believed to overwinter resident Tongue River fish. Downstream of Brandenburg, irrigation has an increasing influence on instream flows and riparian habitat. Below T&Y Diversion dam, chronic dewatering is a major habitat concern for Tongue and Yellowstone River fishes.

Irrigation diversion dams have been barriers to fish movement and have fragmented fish populations in the Tongue River for the last 100 years. In addition, the irrigation canals are responsible for entraining fish. The T & Y canal has a modified headworks structure with louvers to minimize fish entrainment. The SH diversion dam (removed fall 2009) and the Muggli bypass channel (constructed fall 2008) around T & Y Diversion Dam has provided successful passage of many native fish species upstream and restored some connectivity between the Tongue and Yellowstone Rivers, but water and passage continue to be the primary fisheries needs of the Tongue River.

Although the drainage is predominately rural, habitat changes have impacted the system since human settlement. Developments include the construction of railroads, and roads to accommodate vehicle travel (county roads, state highways and a federal interstate highway). All of these developments have impacted the river and streams ability to migrate laterally and interact with its historic floodplain. The use of rock or concrete rip rap to protect city infrastructure, roads, bridges, homes, and farmland/ranchland has restricted the natural function of the rivers and streams in this drainage. The installation of culverts, fords and dams has similar impacts on the function of the waterways and upstream migration of fish.

The vast majority of private and public ponds in the drainage are limited by water depth. Most have a maximum depth of 10-11 feet which is marginal for overwintering fish during winters with sustained snow accumulations. The severity and prevalence of winterkills has been and can be reduced by installing windmill aerators. Some landowners and the BLM have installed aerators at their expense in order to reduce winterkill occurrences at ponds they own. FWP has refrained from installing aerators because of the time and expenses required to service and maintain the structures.

## **FISHING ACCESS**

There is currently public access to the Tongue River through Tongue River Reservoir State Park and Twelve Mile Dam FAS. Additional limited access is also provided at county bridges and through landowner agreements. Developing more access for ice fishing on the Tongue River Reservoir is a high priority; of particular interest is State land under DNRC management that would provide access to the upper portion of the reservoir. Other high priority areas for

development include sites downstream of Tongue River Reservoir and Twelve Mile Dam FAS that would be within a day's floating distance from those access points. The Birney and Brandenburg reaches, of the Tongue River, would also provide valuable angling opportunity if access was available.

#### **SPECIAL MANAGEMENT ISSUES**

Resource management in the Tongue River drainage requires involvement with many agencies, entities, and user groups. Reservoir issues may include involvement with DNRC, the Decker Coal Mine, and adjacent landowners. The Tongue River water users group (representatives from agencies and irrigation districts), Bighorn, Rosebud, and Custer county conservation districts, Northern Cheyenne and Crow Indian Reservations as well as ranchers and farmers are all stakeholders in resource management decisions in the Tongue River drainage. Land use, energy development, and water allocation are special management issues that affect multiple stakeholders in the drainage.

Construction of a Tongue River Railroad has been proposed to facilitate increased coal extraction available from opening Otter Creek coal mine and expansion of Decker and Spring Creek coal mines. The railroad would be constructed along the banks of the Tongue River for much of its course.

Securing appropriate instream flow rights is a special management concern for the Tongue River. The lower stretch of the Tongue River downstream of the T & Y diversion dam is chronically de-watered. Instream flow needs have been determined by FWP for sauger, shovelnose sturgeon and channel catfish in the Tongue River. These species need a minimum of 190 cfs in the river in the months of September to February, 525-600 cfs from March through June to facilitate spawning runs and rearing, and 225 cfs from July to August. Securing adjudicated water rights for instream flow in the Tongue River according to these guidelines is a special management concern.



PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

**FISHERIES MANAGEMENT DIRECTION FOR TONGUE RIVER DRAINAGE**

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Tongue River - Wyoming State Line to Tongue River Reservoir headwaters	10 miles	Sauger (N)	Wild	Conservation/ Restrictive Regulations	Reduced daily bag and possession limit implemented to protect remnant population.
		Channel catfish (N)	Wild	General	Maintain fishery through regulations.
		Smallmouth bass, Walleye	Wild	General	Maximize harvest and fishing opportunity to reduce competition with sauger.
		Multi species	Wild	General/Conservation	Manage for recreational fishing opportunity where applicable. Monitor non-game fish species for native fish assemblage and overall ecosystem health.
Habitat needs and activities: Dewatering is a threat to game and nongame fish, work with Wyoming adjudication process to evaluate Interstate water compact interpretation.					
Tongue River Reservoir	3700 acres	Black crappie, white crappie	Wild	Liberal Regulations	Manage for recreational family fishing opportunity for crappie. Because of congestion during holiday weekends tournaments will be restricted from the week before and after the following weekends: Memorial Day, Fathers Day, Fourth of July, Labor Day.
		Sauger (N)	Wild	Conservation/ Restrictive Regulations	Reduced daily bag and possession limit to protect remnant population
		Walleye	Hatchery	Put-Grow-Take	Manage as recreational fishery with emphasis on harvest. Maintain population through annual stocking to provide additional fishing opportunity.

PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Smallmouth bass, Largemouth bass, Channel Catfish (N), Northern pike, Yellow perch	Hatchery/ Wild	General/ Put-Grow-Take	Maintain fishery through regulations and stocking.
Habitat needs and activities: work with reservoir operators to regulate water levels with consideration for fishery benefit.					
Tongue River - Reservoir tailwater to Yellowstone River	189 miles	Sauger(N), Channel catfish (N)	Wild	General	Maintain fishery through regulations and habitat projects
		Rainbow trout	Hatchery	Put-Take	Put and take fishery to maximize fishing opportunity in a thermally altered stream reach
		Brown trout	Wild	General	One time stocking to establish self sustaining population in order to maximize fishing opportunity in a thermally altered stream reach
		Shovelnose sturgeon (N)	Wild	General	Monitor usage of Tongue River and potential for species to successfully utilize Muggli Bypass and reestablish upstream portion of Tongue River.
		Blue sucker (N), Sturgeon chub (N)	Wild	Conservation	Montana Species of Concern, monitor use and potential for spawning activity in Tongue River. Continue to monitor passage of blue sucker through the Muggli Bypass and use of river upstream.
		Walleye, Smallmouth bass, Northern pike	Wild	General	Maximize harvest and fishing opportunity to reduce competition with sauger.
		Multi species	Wild	Conservation/General	Manage for recreational fishing opportunity where applicable. Monitor non-game fish species for native fish assemblage and overall ecosystem health.

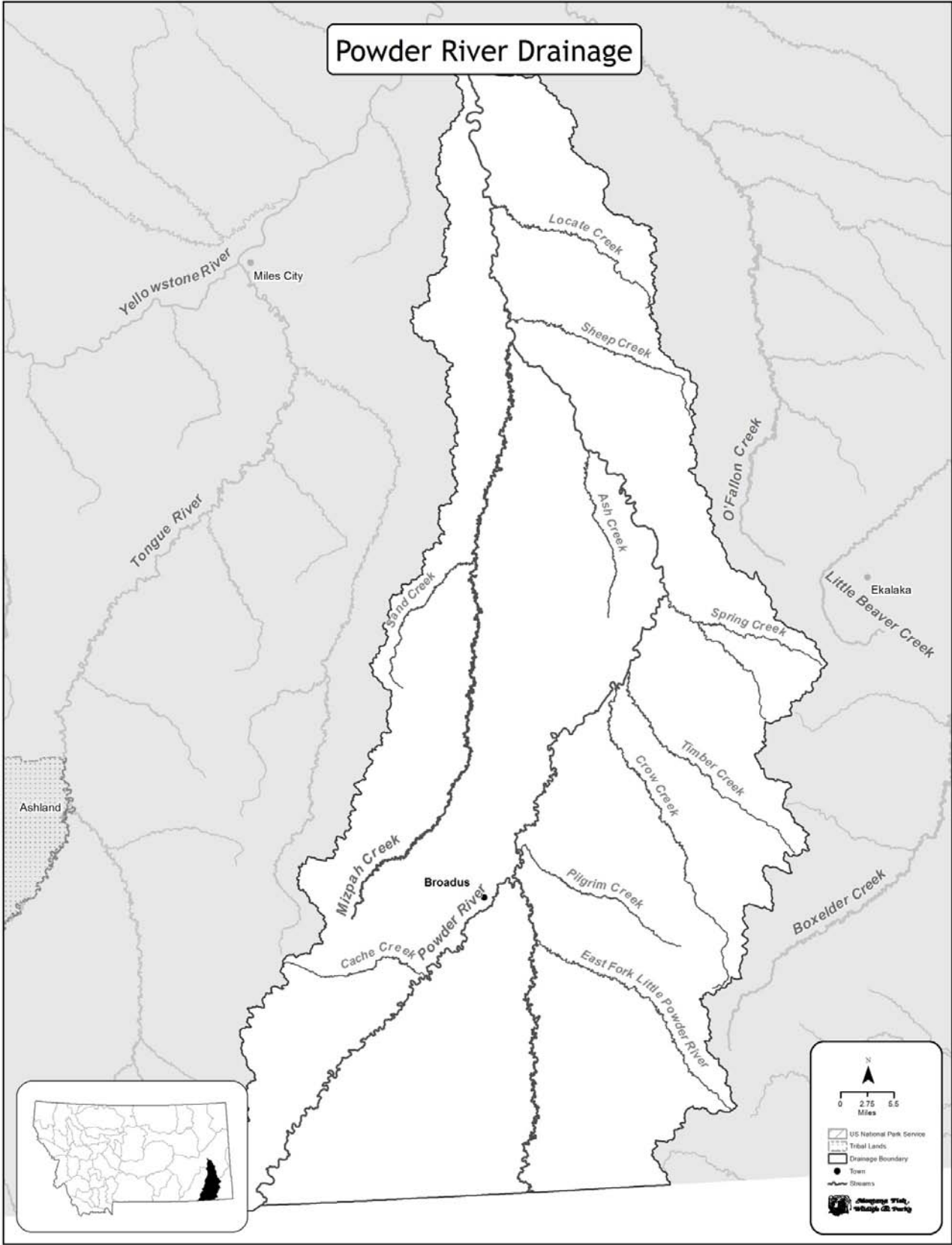
**PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN**

<b>Water</b>	<b>Miles/acres</b>	<b>Species</b>	<b>Recruitment Source</b>	<b>Management Type</b>	<b>Management Direction</b>
Habitat needs and activities: Work with reservoir operator to manage water releases to mimic natural hydrograph and manage flow to avoid stranding fish. Reduce fish entrainment into irrigation intakes. Maintain/restore river ecosystem health and function by minimizing or removing stream bank stabilization projects thereby decreasing channel confinement.					
Intermittent Streams: Pumpkin Creek, Otter Creek, Hanging Women Crk	171 miles 103 miles 48 miles	Multi Species	Wild	General/Conservation	Maintain fishery through habitat protection and restoration. Maintain or increase connectivity. Opportunistic monitor to further understand system and population dynamics.
Ephemeral Streams: 9 with documented fish populations	Various				
Habitat needs and activities: Improve fish passage at current restrictions (culverts, fords, dams) and ensure future structures provide for adequate creek flow and fish passage.					
Small Private Ponds/Reservoirs	Various	Trout	Hatchery	Put-Take	Public relations opportunity with landowners to provide local fishing opportunity for rural community. Maintain fishery through regulations and annual stocking.
		Bass, Walleye, Northern pike	Wild/ Hatchery	General/ Put-Grow-Take	Public relations opportunity with landowners to provide local fishing opportunity for rural community. Maintain fishery through regulations and stocking when necessary.
		Crappie, Yellow perch, Bluegill	Wild/ Transfer	General	Public relations opportunity with landowners to provide local fishing opportunity for rural community. Provide panfish angling opportunity, supplement population through wild fish transfers when necessary.
Habitat needs and activities: Water depth (ponds less than 12 feet deep) is a common limitation that leads to frequent winterkills; limitation offset by frequent sampling and stocking or wild fish transfers.					

PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Public Trout Ponds: Mud Turtle, Blacks Sawmill, Dean S	2 acre 1 acres 1 acre	Trout	Hatchery	Put-Take	Annual stocking of trout for angler opportunity.
Habitat needs and activities: water depth (ponds less than 12 feet deep) is a common limitation that leads to frequent winterkills; limitation offset by annual stocking.					





## **POWDER RIVER DRAINAGE**

### **PHYSICAL DESCRIPTION**

The Powder River drainage includes the Little Powder River and two intermittent tributaries (Mizpah Creek and Locate Creek) and drains portions of Carter, Powder River, Custer and Prairie Counties. The headwaters of the Powder River and Little Powder River are located in Wyoming. The Little Powder River flows approximately 72 miles from the Wyoming state line before converging with the Powder River. The confluence of the Powder River with the Yellowstone River is approximately 220 river miles downstream from the Wyoming border. Additionally, 550 miles of fish-bearing stream exist within 44 other streams or creeks within the drainage.

The drainage is rural and includes the small community of Broadus. The landscape is dominated by plains grassland complex but includes a large area of shrub grassland. Cottonwood bottoms dominate much of the riparian area. Land ownership includes state and federal lands but is dominated by private property. Agriculture, primarily ranching and secondarily dry land farming dominate the land use. Industrial exploration and development of the following natural resources is also occurring: coal and bentonite mining, natural gas and oil drilling, and wind turbines.

No natural lakes are found in the drainage, however, numerous stock ponds exist and many provide public access are managed as a fishery and stocked by FWP. In addition to the creeks mentioned above there are numerous warm water prairie streams throughout the drainage. Some the prairie streams hold game fish and many host a considerable number of native and introduced fisheries.

### **FISHERIES MANAGEMENT**

The Powder River and tributaries are managed primarily as a general/conservation fishery. No species are being stocked in any of the rivers/creeks in the drainage. The primary management focus for the entire drainage is to improve fish passage where current restrictions exist (culverts, fords) and ensure future structures provide for adequate stream function and fish passage.

Fish sampling within the drainage has been limited and sporadic. The infrequent sampling that has occurred utilized electrofishing and seining gears. Much of the recent sampling has been associated with a larger scale prairie fish sampling effort and specific educational activities for school programs. Due to low fishing pressure in the drainage there are no specific management goals. .

Like other prairie stream systems the fish assemblage in the Powder River drainage is largely dominated by native species. The Powder River hosts three game fish, channel catfish, sauger, and shovelnose sturgeon. Saugers are classified as a Species of Concern in Montana. In addition to the game fish, 27 native fish species and nine introduced fish species are present in the Powder River. Channel catfish are the only game fish inhabiting the Little Powder River; however, 16 native fish species and four introduced fish species reside within its waters.



The Powder River drainage does not include any large lakes or reservoirs but does support seven private ponds and four public ponds that are managed as a fishery in the FWP Region 7 Pond Fishing Program. The primary justification for stocking these waters is providing a family fishing opportunity. The program is offered to landowners as a public relations opportunity to provide a fishery for the surrounding community. As long as the landowner allows free public access to the pond, FWP will stock and manage the fishery. Anglers are required to obtain landowner permission each time they want to access the fishery. Rainbow trout, largemouth bass, yellow perch, northern pike and crappie dominate the species available in these systems. The fisheries are sampled at least once every three years to examine population densities and size structures. Populations are established or supplemented when needed through stocking from a state hatchery or by wild fish transfers from another fishery within the region.

## **HABITAT**

The Powder River is undammed and exhibits a relatively natural hydrograph. Fluctuations of the hydrograph often consist of rapid but short-duration elevated flows resulting from Wyoming mountain snowpack melt or from local rain events. The basin has a significant percentage of highly erodible soils consisting of gumbo, clay and silt. The landscape within the basin is dominated by rough breaks, badlands and buttes. The combination of highly erosive soils and steep/rough terrain often result in large amounts of suspended sediments within the water column and bed load material dominated by sand and silt. Sediment load of the Powder River has the potential to, and often does, alter water turbidity and substrate of the Yellowstone River downstream of the Powder River confluence.

Many native species in the Yellowstone River evolved with and rely upon increased turbidity as a spawning cue and some of these species concentrate downstream of the Powder/Yellowstone River confluence each spring. Sauger, channel catfish, paddlefish (during high flow years that accommodate passage at the Intake Diversion on the Yellowstone River), and shovelnose sturgeon are four native game fishes that rely upon increased turbidity and have been documented to aggregate below the Powder River confluence. The significance of elevated turbidity and bed load of the Powder River to the native fish species of the Yellowstone River is likely substantial and may be critical to their life history. Prior to construction of Tongue River Reservoir and Yellowtail Dam, the Tongue River and Big Horn River had similar sediment regimes to that of the Powder River. The Powder River is the last large tributary to the Yellowstone River that provides a natural hydrograph with a natural sediment/turbidity regime, thus its significance to the native species is imperative and deserves additional evaluation.

The Powder River drainage is predominately rural and recent major habitat changes are limited. Developments include the construction of railroads, as well as numerous roads to accommodate vehicle travel (county roads, state highways and a federal interstate highway). All of these developments have impacted the river and its ability to migrate laterally and interact with its historic floodplain. The use of rock or concrete rip rap to protect city infrastructure, roads, bridges, homes, and farmland/ranchland has restricted the natural function of the rivers and streams in this drainage. The installation of culverts, fords and dams has similar impact on the function of the waterways and even a greater impact on the upstream migration of fish. Irrigation resulting in the dewatering of the rivers/streams is also a habitat concern within the drainage.

Many of the private and public ponds in the drainage are limited by water depth. Most ponds have a maximum depth of 10-11 feet which is marginal for overwintering fish during winters with sustained snow accumulations. The severity and prevalence of winterkills may be reduced by installing windmill aerators. Some landowners and the BLM have installed aerators at their expense in attempt to reduce fish winterkill occurrences. The regional Fish, Wildlife and Parks fisheries program has refrained from installing aerators for multiple reasons but mainly because of the time and expenses required to service and maintain the structures.

#### **FISHING ACCESS**

There are currently two points of access to the Powder River and one point of access to the Little Powder River. The Powder River Depot provides angler access with undesignated camping and a hand-launch --only near the confluence with the Yellowstone River. The second point of fishing access is the Broadus Bridge FAS (river mile 152) and provides day use only and no boat ramp. The single point of access to the Little Powder River is near Broadus and provides day use only and no boat ramp. This access is located near the confluence with the Powder River. Considering the rural nature of the drainage and limited game species in the streams, fishing pressure is low. Access to fish streams is likely attained through private property access, county road crossings and public land.

#### **SPECIAL MANAGEMENT ISSUES**

There are currently no special management issues in the Powder River drainage because of low fishing pressure and limited game species available.

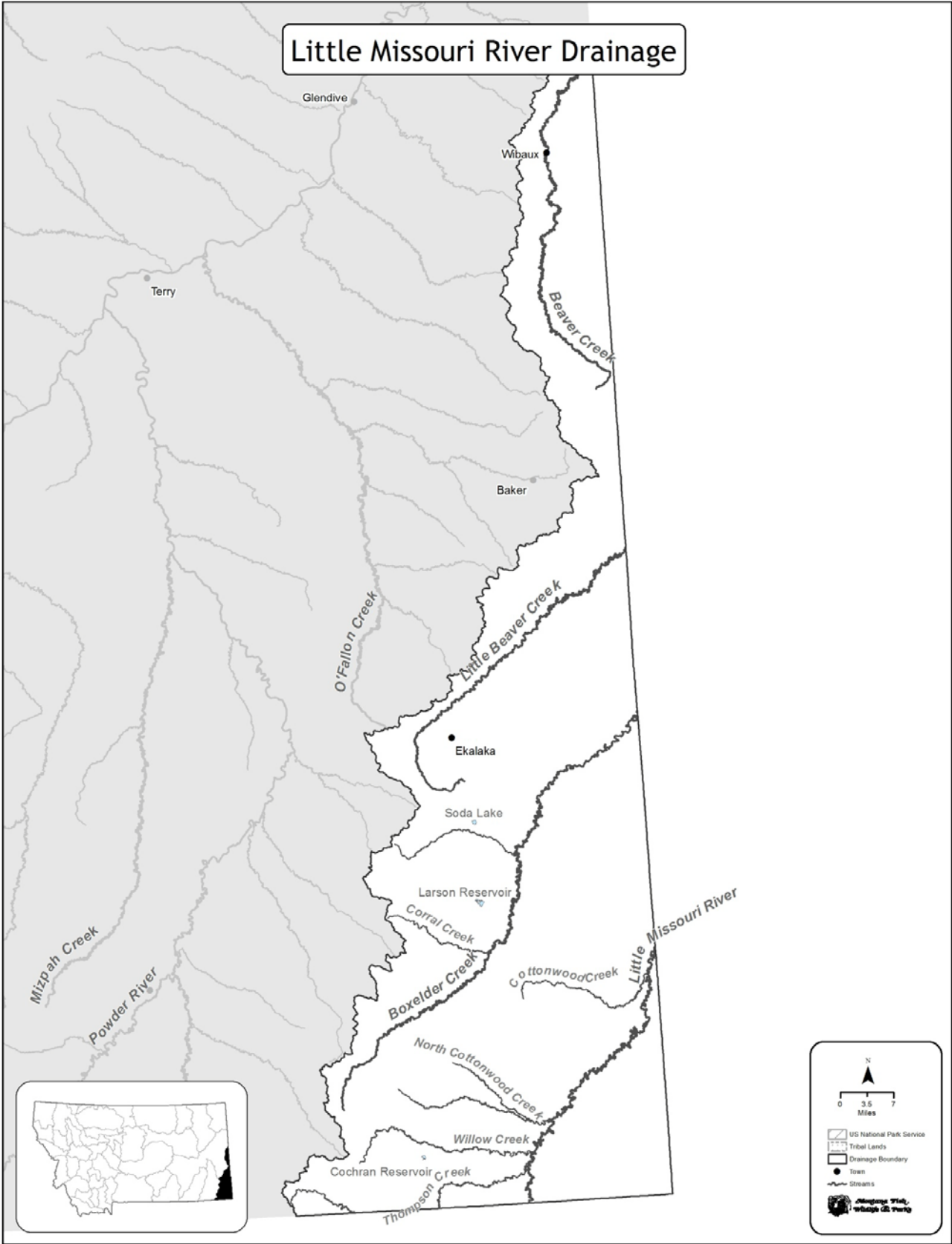
PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

FISHERIES MANAGEMENT DIRECTION FOR POWDER RIVER DRAINAGE

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Powder River	220 miles	Sauger (N) Channel catfish (N)	Wild	General	Maintain harvest level, relative abundance, and size structure through regulations.
		Shovelnose sturgeon (N)	Wild	General	Manage as a recreational fishery with some harvest opportunity. Monitor health of this long lived native species.
		Blue sucker (N)	Wild	Conservation	Monitor population and investigate life history and movements.
		Multi species	Wild	General/Conservation	Manage for recreational fishing opportunity where applicable. Monitor non-game fish species for native fish assemblage and overall ecosystem health.
Habitat needs and activities: Dewatering is a threat to game and non-game fish, work with Wyoming adjudication process to evaluate compact interpretation. Reduce fish entrainment into irrigation intakes.					
Little Powder River	72 miles	Channel catfish (N)	Wild	General	Maintain harvest level, relative abundance, and size structure through regulations.
		Multi species	Wild	General/Conservation	Manage for recreational fishing opportunity where applicable. Monitor non-game fish species for native fish assemblage and overall ecosystem health.
Habitat needs and activities: Improve fish passage at current restrictions (culverts, fords, dams) and ensure future structures provide for adequate creek flow and fish passage.					
Intermittent Streams: Mizpah Creek, Locate Creek	150 miles 42 miles	Multi spies	Wild	General/Conservation	Manage for recreational fishing opportunity where applicable. Monitor non-game fish species for native fish assemblage and overall ecosystem health.

PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Ephemeral Streams: 10 with documented fish populations	Various				
Habitat needs and activities: Improve fish passage at current restrictions (culverts, fords, dams) and ensure future structures provide for adequate creek flow and fish passage.					
Small Private Ponds/Reservoirs	Numerous	Trout	Hatchery	Put-Grow-Take	Public relations opportunity with landowners to provide local fishing opportunity for rural community. Maintain fishery through regulations and annual stocking.
		Bass, Walleye, Northern pike	Wild/ Hatchery	General/ Put-Grow-Take	Public relations opportunity with landowners to provide local fishing opportunity for rural community. Maintain fishery through regulations and stocking when necessary.
		Crappie, Yellow perch, Bluegill	Wild/ Transfer	General	Public relations opportunity with landowners to provide local fishing opportunity for rural community. Provide panfish angling opportunity, supplement population through wild fish transfers when necessary.
Habitat needs and activities: Water depths. (less than 12 feet deep) is a common limitation that leads to frequent winterkills; limitation offset by frequent sampling and stocking or wild fish transfers.					
Public Trout Ponds: Beardsley Rest Boulware	 2 acres 1 acre 1 acre	Trout	Hatchery	Put-Grow-Take	Annual stocking of trout for angler opportunity.
Habitat needs and activities: Water depths. (less than 12 feet deep) is a common limitation that leads to frequent winterkills; limitation offset by frequent sampling and stocking.					



## **LITTLE MISSOURI RIVER DRAINAGE**

### **PHYSICAL DESCRIPTION**

The Little Missouri River drainage includes the Little Missouri River and two perennial tributaries (Box Elder Creek and Beaver Creek) and drains portions of Carter, Fallon and Wibaux counties. Only a small segment of each tributary exists in Montana and all are tributaries of the Missouri River in North Dakota. The headwater of the Little Missouri River is located in Wyoming and only 104 miles exist in Montana before crossing into North Dakota. The headwaters for the other three tributaries occur in Montana and converge with the Little Missouri River in North Dakota.

The drainage is located in a rural setting which includes three small communities: Ekalaka, Baker and Wibaux. The landscape is dominated by plains grassland complex but includes a large area of shrub grassland and a smaller area of plains forest called the Custer National Forest. Land ownership includes state and federal lands but is dominated by private property. Agriculture, primarily ranching and secondarily dry land farming dominate the land use. Industrial exploration and development of the following natural resources is also occurring: coal and bentonite mining, natural gas and oil drilling, and wind turbines.

No natural lakes are located in the drainage, however, numerous stock ponds exist and many are managed as fisheries with public access. In addition to the creeks mentioned above, there are numerous warm water prairie streams throughout the drainage. Some hold game fish and many host a considerable number of native and introduced fish species.

### **FISHERIES MANAGEMENT**

The Little Missouri River and tributaries are managed primarily as a general/conservation fishery. Walleye are stocked in Beaver Creek and is the only species currently being stocked in any of the creeks/streams in the drainage. However, past and current stocking practices in Montana and North Dakota have influenced the fish assemblage. The primary management focus for the entire drainage is to improve fish passage at existing restrictions (culverts, fords, dams) and ensure future structures provide for adequate stream function and fish passage.

Fish sampling within the drainage has been limited to sporadic and infrequent seining activities associated with a larger-scale prairie fish sampling effort and specific educational activities for school programs. Most of the fisheries data in the drainage has been collected in the last decade. Because fishing pressure is very low, there are no specific management goals or fishing regulations for the drainage.

Like other prairie stream systems, the fish assemblage in the Little Missouri drainage is broad and dominated by native species. The Little Missouri River hosts eleven native fish species, five introduced fish species and only one game species (channel catfish). Box Elder Creek supports sixteen native fish species, five introduced fish species, and three game species (northern pike, channel catfish and sauger). Sauger are classified as a Species of Concern in Montana. Little Beaver Creek contains seven native fish species, three introduced fish species, and two game

species (northern pike and channel catfish). Beaver Creek hosts eleven native fish species, six introduced fish species, and two game species (northern pike and walleye).

The Little Missouri River drainage does not include any large lakes or reservoirs but does have eleven private ponds and thirteen public ponds that are managed as fisheries in the Regional Pond Fishing Program. The primary justification for stocking these waters is providing a family fishing opportunity. The program is offered to landowners as a public relations opportunity to provide a fishery for the surrounding community. As long as the landowner allows free public access to the pond FWP will stock and manage the fishery. Anglers are required to obtain landowner permission each time they want to access the fishery. Rainbow trout, largemouth bass, yellow perch, northern pike and crappie dominate the species available in these systems. The fisheries are sampled at least once every three years to examine population densities and size structures. Populations are established or supplemented when needed through stocking from a state hatchery or by wild fish transfers from another fishery within the region.

### **HABITAT**

Although the drainage is predominately rural and major changes have not occurred, habitat changes have impacted the system since human settlement. Developments include the construction of railroads, as well as numerous roads to accommodate vehicle travel (county roads, state highways and a federal interstate highway). All of these developments have impacted the ability of rivers and streams to migrate laterally and interact with their historic floodplain. The use of rock or concrete rip rap to protect city infrastructure, roads, bridges, homes, and farmland/ranchland has restricted the natural function of the rivers and streams in this drainage. The installation of culverts, fords and dams impact the function of the waterways and upstream migration of fish.

The vast majority of private and public ponds in the drainage are limited by water depth. Most have a maximum depth of 10-11 feet which is marginal for overwintering fish during winters with sustained snow accumulations. The significance and prevalence of winterkills has been and can be reduced by installing windmill aerators. Some landowners and the BLM have installed aerators at their expense in order to reduce winterkill occurrences at ponds they own. FWP has refrained from installing aerators because of the time and expenses required to service and maintain the structures .

### **FISHING ACCESS**

Considering the rural nature of the drainage and limited game species in the streams, fishing pressure is extremely low and demand for a fishing access site has not occurred. Consequently development of a fishing access site is a low priority within the drainage. Access for fishing in the streams is probably met through private property access, county road crossings and public land.

### **SPECIAL MANAGEMENT ISSUES**

There are no special management issues in the Little Missouri River drainage considering the low fishing pressure experienced and limited game species available.



PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

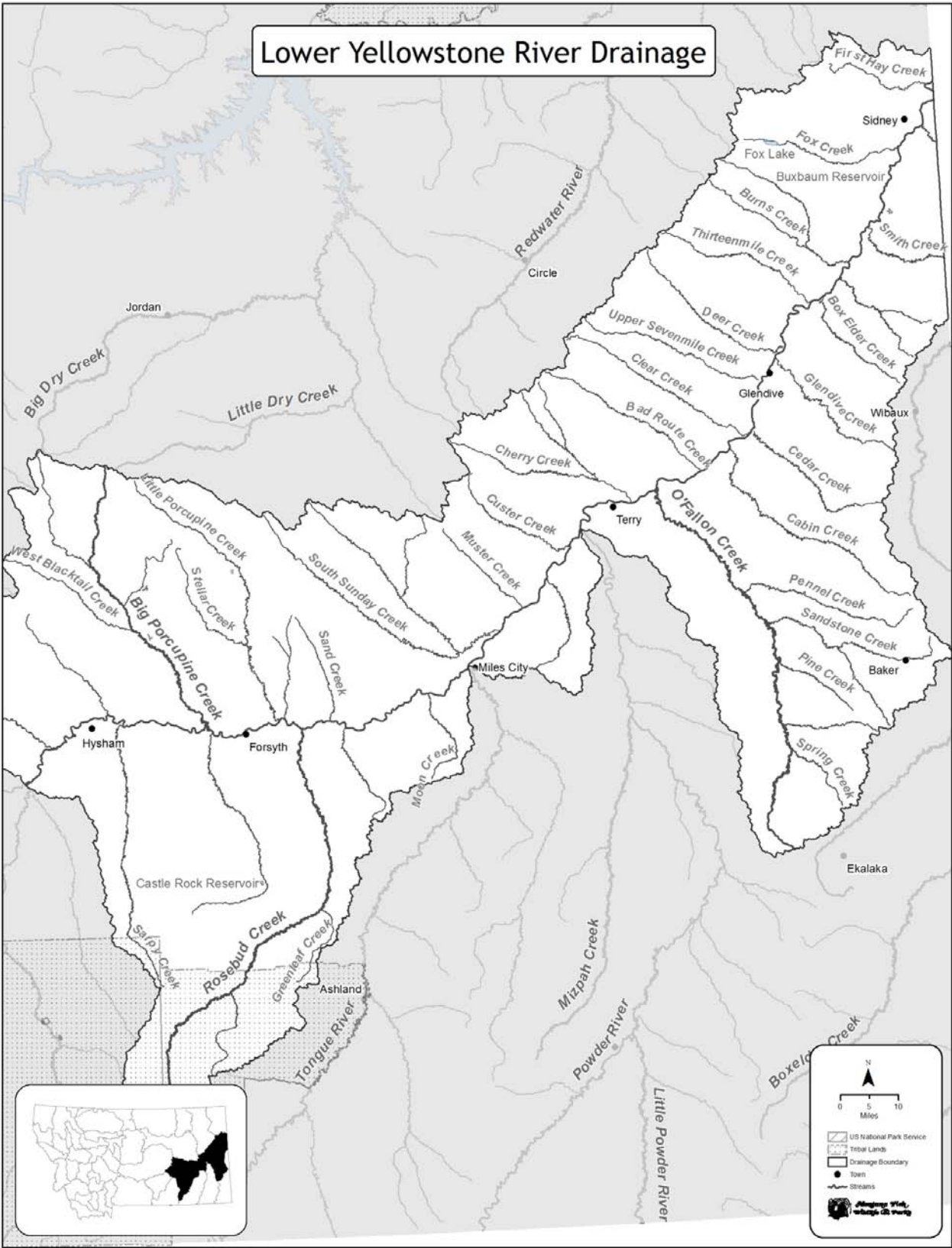
FISHERIES MANAGEMENT DIRECTION FOR LITTLE MISSOURI RIVER DRAINAGE

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Beaver Creek	120 miles	Walleye	Hatchery	General	Annual stocking of walleye for increased angler opportunities.
		Multi species	Wild	General/Conservation	Manage for recreational fishing opportunity where applicable. Monitor non-game fish species for native fish assemblage and overall ecosystem health.
Habitat needs and activities: improve fish passage at current restrictions (culverts, fords, dams) and ensure future structures provide for adequate creek flow and fish passage.					
Perennial Streams: Box Elder Creek Little Missouri,	151 miles 106 miles	Multi species	Wild	General/Conservation	Manage for recreational fishing opportunity where applicable. Monitor non-game fish species for native fish assemblage and overall ecosystem health.
Intermittent Streams: Little Beaver	12 miles				
Ephemeral Streams: 28 with documented fish populations					
Habitat needs and activities: improve fish passage at current restrictions (culverts, fords, dams) and ensure future structures provide for adequate creek flow and fish passage.					
Small Private Ponds/Reservoirs	Numerous	Trout	Hatchery	Put-Grow-Take	Public relations opportunity with landowners to provide local fishing opportunity for rural community. Maintain fishery through regulations and annual stocking.
		Bass,	Wild/	General/	Promote opportunity with landowners to

PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Walleye, Northern pike,	Hatchery	Put-Grow-Take	provide local fishing opportunity for rural community. Maintain fishery through regulations and stocking when necessary.
		Crappie, Yellow perch, Bluegill	Wild/ Transfer	General	Promote opportunity with landowners to provide local fishing opportunity for rural community. Provide panfish angling opportunity, supplement population through wild fish transfers when necessary.
Habitat needs and activities: water depth (ponds less than 12 feet deep) is a common limitation that leads to frequent winterkills; limitation offset by frequent sampling and stocking or wild fish transfers.					





## **LOWER YELLOWSTONE RIVER DRAINAGE**

### **PHYSICAL DESCRIPTION**

The Lower Yellowstone River Drainage includes the Yellowstone River, seven perennial streams (Burns, Rosebud, O'Fallon, Cedar, Cabin, Fox, and Thirteen Mile creeks) and numerous intermittent and ephemeral warmwater prairie streams. No natural fisheries lakes are located within the drainage; however, nine public reservoirs (Castle Rock, Baker, Hollecker, South Sandstone, Gartside, Johnson's, Rattlesnake, Homestead, and Spotted Eagle) and numerous smaller public and private reservoirs and stock ponds are managed for fisheries. The drainage includes all or portions of Big Horn, Treasure, Rosebud, Custer, Prairie, Dawson, and Richland counties.

The Yellowstone River is the largest water body within the drainage. The headwater of the Yellowstone River is above Yellowstone Lake in northwest Wyoming. The Yellowstone River flows north into Montana and continues northeast through central and eastern Montana and crosses into North Dakota approximately fifteen miles prior to its confluence with the Missouri River. The Yellowstone River in administrative Region 7 consists of 293 river miles between the Bighorn River confluence and North Dakota state line. About 90% of all uses of Yellowstone River water in the drainage is for irrigation; roughly 1.5 million acre-feet of water is used annually. Irrigation pumps, gravity-feed canals without dams, and gravity-feed canals with mainstem low-head irrigation diversion dams (Ranchers, Yellowstone River, Cartersville and Intake) are used to withdraw water for irrigation.

The Lower Yellowstone River Drainage is located in a rural setting with small communities (Hysham, Forsyth, Colstrip, Rosebud, Miles City, Terry, Fallon, Glendive, Savage, Crane, Lambert and Sidney). The landscape is dominated by plains grassland complex, but includes a large area of shrub grassland and a smaller area of plains forest. Land ownership includes state and federal lands but is dominated by private property. Agriculture, primarily ranching and secondarily dry land and irrigated farming, dominate the land use. Industrial activities include coal mining at Colstrip and natural gas and oil drilling in Richland and Dawson counties.

### **FISH MANAGEMENT**

The relatively natural hydrograph and intact habitat of the lower Yellowstone River and its tributaries support a rich fish assemblage composed of many warmwater and coolwater species, and a few coldwater species. Native fish species include: sauger, shovelnose sturgeon, pallid sturgeon, channel catfish, burbot, paddlefish, freshwater drum, goldeye, shortnose gar, smallmouth buffalo, bigmouth buffalo, blue sucker, river carpsucker, shorthead redhorse sucker, white sucker, longnose sucker, mountain sucker, longnose dace, northern redbelly dace, creek chub, lake chub, sturgeon chub, brook stickleback, brassy minnow, fathead minnow, plains minnow, flathead chub, western silvery minnow, sand shiner, emerald shiner, golden shiner, and stonecat. Common carp, plains killifish, black bullhead, yellow bullhead, and green sunfish are introduced species that can be found in parts or all of the drainage. Largemouth bass, smallmouth bass, walleye, white crappie, black crappie, northern pike, yellow perch, bluegill, and pumpkinseed have been stocked or illegally introduced and are found in reservoirs, stock ponds;

some species are also established in the Yellowstone River and tributaries. Brown trout, rainbow trout, brook trout, and mountain whitefish inhabit reaches of the Yellowstone River near and upstream of the Bighorn River confluence. Brook trout are also found in four small tributaries of the lower Yellowstone River. All four tributaries are influenced by coldwater releases from large groundwater springs.

A primary fisheries management objective for the lower Yellowstone River is monitoring and maintaining the wild and self-sustaining populations of native species. This objective includes maintaining recreational harvest, on a limited basis, for native game species. Another primary objective is monitoring, maintaining and improving the overall ecosystem health of the river. This objective includes monitoring stream bank projects to ensure habitat protection and allowing for natural stream form and function for efficient transport of both water and sediment. A secondary management objective is to maintain a recreational fishery for introduced fish species with an emphasis on harvest.

The lower Yellowstone supports a wild sauger population. Monitoring and sustaining this population for native species preservation and recreational angling is a primary management concern for FWP fisheries staff in Region 7. Annual spring tagging of spawning sauger and subsequent recapture information from department sampling efforts and angler tag returns provides data used to estimate angler harvest and document fish movement. In the Yellowstone River above Cartersville diversion dam there is a reduced limit on sauger because trend data suggest lower relative abundance of sauger upstream of this structure.

One threat to maintaining the sauger population in the Yellowstone River is the expanding population of nonnative smallmouth bass. The smallmouth bass population has the potential to outcompete and displace sauger in some reaches of its historic range. In 2005, stable isotope analysis was used to investigate competition for prey between sauger and smallmouth bass in the Yellowstone River. Tissue samples for isotope analysis were collected from 10 prey species in July 2005 near Rosebud Montana. Results show that sauger and smallmouth bass (>200mm) overlap almost completely in both carbon and nitrogen, indicating that these species are at the same trophic level and are consuming prey with the same carbon isotope signature in similar proportions (i.e. they are dependent on the same prey source).

Trend sampling on the Yellowstone River has demonstrated that sauger abundances are negatively correlated with smallmouth bass abundances. Smallmouth bass progressively replaced sauger as the most abundant predator in the Forsyth and Miles City areas during the consecutive drought years experienced in the 1980's and early 1990's. Specific life history stages, like spawning and foraging, are dependent on a natural hydrograph and increased turbidity. Smallmouth bass are visual feeders well suited to low turbidity conditions. Drought or low flow years result in reduced turbidity which favors smallmouth bass, while wet or high flow periods increase turbidity and favor sauger populations. Loss of the natural hydrograph and reduced turbidity from drought and dam operations on tributaries (Yellowtail and Tongue River Reservoirs), along with continued allocation of river water for irrigation or municipal use and armoring of stream banks on the Yellowstone River, all create conditions that favor smallmouth bass over sauger.

The lower Yellowstone River is one of the few places left in North America where anglers can catch and harvest a paddlefish. With technical guidance provided by the University of Idaho, Montana FWP and North Dakota Game and Fish manage the paddlefish population in the lower Yellowstone River cooperatively. Paddlefish management is guided by the 10-year "Management Plan for North Dakota and Montana Paddlefish Stocks and Fisheries." Fish from this population spend most of their lives in the headwaters of Lake Sakakawea. In May and June during elevated Yellowstone River discharge, paddlefish seasonally migrate up the Yellowstone and Missouri Rivers to spawn. During paddlefish season, anglers can fish for paddlefish from the Bighorn River confluence to the North Dakota state line, but most angling occurs at and downstream of Intake FAS. The paddlefish season has a specific set of regulations and management activities designed to ensure that this long-lived, late to mature species can continue to provide sport fishing opportunity in Montana. FWP attempts to maximize angler opportunity while ensuring sustainability with a split season, with harvest-only days and catch-and-release-only days. Data collected from tagging efforts during catch-and-release fishing allows estimation of the population size each year. Data collected from harvested fish allows evaluation of population structure. Together this information allows FWP to monitor the overall size of the population and condition of the individuals within the population through time. A statewide paddlefish telephone creel is conducted annually to obtain a harvest estimate that is compared to the field-measured harvest.

Research activities are conducted to understand and aid recovery of pallid sturgeon, a federally endangered species and state Species of Concern. Recent research includes monitoring adult pallid sturgeon migration pathways and reproduction within the Yellowstone River. The lack of successful natural recruitment prompted the stocking of juvenile hatchery-reared pallid sturgeon into the Yellowstone River as far upstream as Cartersville diversion dam. These fish are reared by state and federal hatcheries including the Miles City State Fish Hatchery. Annual monitoring of juvenile pallid sturgeon occurs in late summer/early fall to assess the survival rate of hatchery-stocked pallid sturgeon into the Yellowstone River. No angling is allowed for pallid sturgeon because of its endangered species status.

Trend electrofishing is conducted annually on five reaches of the lower Yellowstone River to assess and monitor relative abundance, population structure, and relative condition of all fish species. Trend sections are six miles long and are located at Hysham, Forsyth, Miles City, Fallon, and Intake. Each site is sampled once in the months of August, September, and October. Data collected during this period is the baseline information for monitoring relative abundance and condition of sport fish and native species in the lower Yellowstone River. In the Yellowstone River and tributaries, the primary objective for all fish species is to monitor and sustain a wild fishery. Fish stocking will not occur in a river system unless natural spawning and recruitment are failing or habitat is deemed to be irreparable.

The Lower Yellowstone River Drainage also has many private and public reservoirs and stock ponds that are managed as fisheries in the Regional Pond Fishing Program. The primary justification for stocking these waters is providing a family fishing opportunity. The program is used as a public relations opportunity with landowners and provides a fishing opportunity for the surrounding community. If the landowner agrees to allow free public access to the pond, FWP will stock and manage the fishery. Anglers are required to obtain landowner permission every time they access the fishery. Fish populations are established or supplemented when needed



through stocking from a state hatchery or by wild fish transfers from another fishery. A variety of fish species are available for stocking from a state operated hatchery including: walleye, rainbow trout, smallmouth bass, largemouth bass, channel catfish and northern pike. The statewide wild fish transfer policy also allows transferring fish between waters. Northern pike, yellow perch, black crappie, white crappie, and bluegill are often available for transfer. Transfers are usually done to re-establish or augment ponds affected by winterkill or to provide forage. Reservoirs and stock ponds are sampled by FWP at least every three years to evaluate the status of the fisheries and ensure a catchable stock of fish is present. A Regional Pond Fishing Guide is generated annually that summarizes the pond program, locations of ponds, and fish species available. The guide is available to the public at the regional office.

Overall fishing pressure is low to moderate in the drainage, but increasing on the Yellowstone River due to increasing numbers of anglers owning riverboats and increased public access. Stock ponds and prairie streams in the drainage have high to low angling pressure. Spotted Eagle Pond in Miles City, Hollecker Lake in Glendive, Baker Lake in Baker, South Sandstone Lake near Baker, Castle Rock Lake in Colstrip, and Gartside Reservoir near Sidney all experience high fishing pressure because of proximity to population centers. Many of the public reservoirs and private ponds in the district get moderate to low angling pressure.

## **HABITAT**

The Yellowstone River, touted as the longest undammed river in the lower 48 states, has a relatively intact and natural hydrograph. Hydrograph fluctuations often consist of short-duration elevated flows in early spring from local snow melt and rain events, but longer, sustained, elevated flows in spring/early summer from mountain snow melt. Historically, two major tributaries that are now dammed (Bighorn and Tongue rivers) provided a significant influence on the hydrographs and sediment regime of the lower Yellowstone River. Construction of Tongue River Reservoir (on the Tongue River) and Yellowtail Dam (on the Bighorn River) permanently altered the hydrograph and sediment contribution to the lower Yellowstone River.

These anthropogenic habitat alterations are noteworthy because many native species in the lower Yellowstone River evolved and relied upon increased turbidity as a spawning cue. The increased turbidity and fine-grained streambed material may be critical to the life history of native fish species in the lower Yellowstone River. The resulting reduced turbidity creates favorable conditions for introduced species such as smallmouth bass. Prior to construction of Tongue River Reservoir and Yellowtail Dam, the Tongue River and Bighorn River had sediment regimes similar to the Powder River. Sauger, channel catfish, paddlefish (during high flow years that accommodate passage at Intake) and shovelnose sturgeon are four native game fishes that have been documented to aggregate in the high-turbidity waters downstream of the Powder/Yellowstone River confluence. It is probable that similar fish aggregations historically occurred in the Yellowstone River downstream of the confluences with the Tongue and Bighorn Rivers prior to dam construction.

Four low-head diversion dams on the lower Yellowstone River (Ranchers, Yellowstone, Cartersville and Intake) create anthropogenic barriers to upstream fish migrations. The impact on migration is different at each dam. Cartersville and Intake dams are the most significant fish barriers. Native fishes exhibit extensive seasonal migrations that are critical to their life history and to maintaining populations throughout the lower Yellowstone River. Working with irrigation

districts to facilitate fish passage at barriers is critical for habitat improvement and is a primary goal for the regional fisheries management program. Designs are currently underway to improve/create fish passage at Intake Diversion Dam.

Entrainment of fishes into unscreened canals is a concern in the drainage. Installation of screens on unscreened structures will prevent or reduce the entrainment of fishes into canals and other irrigation structures. In 2011, a new head gate with screens was completed at Intake canal. A screening structure has also been purchased and will be installed at the Buffalo Rapids Shirley pump site. Both projects have/will reduce the annual entrainment of thousands of fish into these canals.

The lower Yellowstone River riparian corridor provides critical wildlife habitat. It varies from sparse ribbons of trees to robust cottonwood galleries. Much of the floodplain is developed for irrigated agriculture. Other developments include the construction of railroads, as well as numerous roads to accommodate vehicle travel (county roads, state highways and a federal interstate highway). All of these developments have impacted the ability of the Yellowstone River to migrate laterally and interact with its historic floodplain. The use of rock or concrete rip rap to protect city infrastructure, roads, bridges, homes, and farmland/ranchland has restricted the natural function of the Yellowstone River and prairie streams in this drainage. These impacts may extend to the quality of fish habitat in the river. The installation of culverts, fords and dams has similar impacts on the function of the river, tributaries, and prairie streams and even greater impacts on upstream fish migrations.

The Lower Yellowstone River Drainage has some of the deepest ponds and reservoirs in the region, but many private and public ponds in the drainage are limited by water depth. Ponds with a maximum depth of 10-11 feet are generally marginal for overwintering fish during winters with sustained snow accumulations. The severity and prevalence of winterkills may be reduced by installing windmill aerators. Some landowners and the BLM have installed aerators at their expense in attempt to reduce winterkill occurrences. FWP has refrained from installing aerators because of the time and expenses required to service and maintain the structures.

## **FISHING ACCESS**

In 2012 there are 18 FASs that provide access to the Lower Yellowstone River. There are several private or undeveloped public access points as well. The Yellowstone River upstream of Ranchers diversion dam can be accessed by Manuel Lisa FAS on the Bighorn River. Myers Bridge FAS provides access to the Yellowstone River between Ranchers diversion and Yellowstone diversion. Rosebud West FAS provides access to the Yellowstone River from Yellowstone diversion to Cartersville diversion. Rosebud East FAS, Far West FAS, Roche Jaune FAS, Kinsey Bridge FAS, Bonfield FAS, Powder River Depot FAS, Calypso Bridge (BLM), Fallon Bridge FAS, Black Bridge FAS, Walleyes Unlimited Boat Ramp (Glendive), and Stipek FAS provide access to the Yellowstone River between Cartersville and Intake diversion dams. Intake FAS, Elk Island FAS, Seven Sisters FAS, Sidney Bridge FAS, and Richland Park (Richland County) provide access to the Yellowstone River downstream of Intake diversion dam. There are also a few sites available at county bridge crossings and some landowner agreements that provide limited access. Amelia Island and Stipek FAS's are scheduled to have boat ramps installed. Other high priority areas include securing access in the reaches between the

Bighorn Confluence and Forsyth, between Rosebud and Miles City, at the bridge in Terry, and between Fallon and Intake.

### **SPECIAL MANAGEMENT ISSUES**

Resource management in the Lower Yellowstone River Drainage requires involvement with many agencies, entities, and user groups. River issues may include involvement with Department of Natural Resources and Conservation, BLM, FWS, BOR, Army Corp of Engineers, Burlington Northern Santa Fe railroad, Yellowstone River Conservation District Council, local conservation districts, and adjacent landowners. Land use, energy development, and water allocation are special management issues that affect multiple stakeholders in the drainage.

Securing appropriate in-stream flow rights is a special management concern for the lower Yellowstone River. Over-allocation of water in the Yellowstone River drainage is poised to be a major threat to fisheries resources in the next drought cycle. The cumulative effect of irrigation withdrawal and withdrawal for oil and gas hydraulic fracturing is of particular concern. Balancing diverse land and aquatic resource uses while maintaining critical habitat for fish and wildlife is also a special management concern. Maintaining current fish passage and recovering lost fish passage due to anthropogenic influences is a special management concern, especially as irrigation districts begin to update infrastructure. Structures such as Yellowstone diversion dam and Ranchers diversion dam do not currently appear to be significant fish passage barriers, but they have the potential to become major barriers if updated without consideration to fish passage.

Paddlefish management on the lower Yellowstone River includes an annual Memorandum of Understanding and permit for a commercial caviar operation conducted by the Glendive Chamber of Commerce. During the paddlefish season the Chamber has a paddlefish processing facility at the Intake FAS. In exchange for having paddlefish cleaned, anglers donate their paddlefish eggs to the caviar operation. The 1993 Legislature authorized paddlefish caviar sales by the Glendive Area Chamber of Commerce and funds generated from the caviar sales must be used for a grant program. Funds are available to non-profit entities through grant applications for projects that meet a historical, cultural, or recreational need. The project must show public benefit and funding is not allowed for projects that are for private benefit. Emphasis is on small non-profit groups in Eastern Montana.

Coal development began in the mid 1970's and continues to be a large industrial activity in the Colstrip area. In 2011, the State of Montana also sold its Otter Creek mineral rights to an out-of-state company. The impact of continued coal operations at Colstrip and development of new mines will be a management concern for many years in the drainage. Oil and natural gas extraction from the Bakken and other shale zones is another industrial activity that will have unknown impacts to the drainage. The majority of drilling is focused in the Sidney and Baker areas. Infrastructure for the oilfield, especially pipeline construction, is a secondary product of oil development that will continue to have impacts on the resources of the LYRD. Immigration of people associated with oil development has increased, and will heighten the demand on natural resources and local infrastructure, especially housing. Management of the local FAS and Wildlife Management Areas have become more challenging due to the influx of people, and changes are being considered to limit the use of these sites.

PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

FISHERIES MANAGEMENT DIRECTION FOR LOWER YELLOWSTONE RIVER DRAINAGE

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Yellowstone River - Confluence of Bighorn River to Cartersville Dam	59 miles	Sauger N)	Wild	Conservation/ Restrictive Regulations	Manage sauger population for limited consumptive harvest by reduced harvest limits.
		Channel catfish (N)	Wild	General	Manage as a recreational fishery. Standardize catfish sampling methods for comparison across eastern Montana.
		Smallmouth bass	Wild	General	Recreational fishery with an emphasis on harvest. Monitor to evaluate the impacts of smallmouth bass on native fish populations in the Yellowstone River.
		Walleye	Wild	General	Recreational fishery with emphasis on harvest. Monitor to evaluate source of walleye in Yellowstone River to direct management decisions for sauger conservation.
		Multi species	Wild	General/Conservation	Manage for recreational fishing opportunity where applicable. Monitor non-game fish species for native fish assemblage and overall ecosystem health.
Habitat needs and activities: Increase fish passage and reduce fish entrainment into canals at Ranchers, Yellowstone, and Cartersville diversion dams and other irrigation intakes. Maintain/restore river ecosystem health and function by minimizing or removing stream bank stabilization projects thereby decreasing channel confinement.					

**PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN**

<b>Water</b>	<b>Miles/acres</b>	<b>Species</b>	<b>Recruitment Source</b>	<b>Management Type</b>	<b>Management Direction</b>
Yellowstone River – Cartersville Dam to Powder River confluence	88 miles	Sauger (N)	Wild	Conservation	Manage sauger populations for limited consumptive harvest. Monitor threat of hybridization with walleye and direct management decisions that maximize angler opportunity while protecting genetic integrity of the sauger population. Protect critical spawning habitat from Miles City to Glendive.
		Paddlefish (N)	Wild	Restrictive Regulations/ Conservation	Monitor paddlefish usage of this section of river in water years that paddlefish successfully migrate upstream of Intake Dam (on average occurs 2 out of every 10 years).
		Channel catfish (N)	Wild	General	Manage as a recreational fishery. Standardize catfish sampling methods for comparison across eastern Montana.
		Smallmouth bass	Wild	General	Recreational fishery with an emphasis on harvest. Monitor to evaluate the impacts of smallmouth bass on native fish populations in the Yellowstone River.
		Walleye	Wild	General	Recreational fishery with an emphasis on harvest. Monitor to evaluate source of walleye in Yellowstone River to direct management decisions for sauger conservation.

**PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN**

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Shovelnose sturgeon (N)	Wild	General/ Conservation	Manage as a recreational fishery with some harvest opportunity. Monitor health of this long lived native species.
		Pallid sturgeon (N)	Wild	Conservation	Endangered species, harvest prohibited. Conduct research to assist decision making for recovery of species. Increase genetic diversity through stocking following pallid sturgeon recovery plan. Establish fish passage at Intake Diversion Dam and monitor subsequent upstream passage and habitat usage.
		Blue Sucker (N)	Wild	Conservation	Monitor population and investigate life history and movements throughout Yellowstone River.
		Multi species	Wild	Conservation/General	Manage for recreational fishing opportunity where applicable. Monitor non-game fish species for native fish assemblage and overall ecosystem health.
Habitat needs and activities: Increase fish passage at Cartersville and Intake Diversion Dams and reduce fish entrainment into irrigation intakes. Maintain/restore river ecosystem health and function by minimizing or removing stream bank stabilization projects thereby decreasing channel confinement. Protect critical sauger spawning habitat from Miles City to Glendive					
Yellowstone River – Confluence of Powder River to North Dakota	134 miles	Paddlefish (N)	Wild	Restrictive Regulations	Intensively monitor population to closely harvest with a harvest target reflective of population trends. Management shared and coordinated through a Montana/North Dakota Management Plan. Annual Memorandum of

PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
State line		Pallid sturgeon (N)	Wild/ Hatchery	Conservation	Understanding between FWP and Glendive Chamber of Commerce for processing of paddlefish and sale of paddlefish roe for funding of a nonprofit community grant program. Increase fish passage at Intake diversion dam to provide additional upstream spawning habitat.  Endangered species, harvest prohibited. Conduct research to assist decision making for recovery of species. Increase genetic diversity through stocking following pallid sturgeon recovery plan. Establish fish passage at Intake Diversion Dam and monitor subsequent upstream passage and habitat usage.
		Sauger (N)	Wild	Conservation	Manage sauger populations for limited consumptive harvest. Monitor threat of hybridization with walleye and direct management decisions that maximize angler opportunity while protecting genetic integrity of the sauger population.
		Channel catfish (N)	Wild	General	Manage as a recreational fishery. Standardize catfish sampling methods for comparison across eastern Montana.
		Shovelnose sturgeon (N)	Wild	General/ Conservation	Manage as a recreational fishery with some



PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Walleye, Northern pike	Wild	General	harvest opportunity. Monitor health of this long lived native species.
		Blue sucker (N)	Wild	Conservation	Recreational fishery with emphasis on harvest. Monitor to evaluate source of walleye in Yellowstone River to direct management decisions for sauger conservation.
		Multi species	Wild	Conservation/ General	Monitor population and investigate life history and movements throughout Yellowstone River.
Habitat needs and activities: Increase fish passage at Intake Diversion Dam and reduce fish entrainment into irrigation intakes. Maintain/restore river ecosystem health and function by minimizing or removing stream bank stabilization projects thereby decreasing channel confinement. Establish fish passage at Intake Diversion Dam and monitor subsequent upstream passage and habitat usage.					
Perennial Streams: Rosebud O'Fallon Big Porcupine Sarpy Cabin South Sunday Cedar	208 miles 157 miles 107 miles 103 miles 98 miles 87 miles 60 miles	Multi species	Wild	Conservation/General	Maintain fishery through habitat protection and restoration. Maintain or increase connectivity. Opportunistic monitor to further understand system and population dynamics.

PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Thirteen Mile Fox Burns  Intermittent Streams: South Sunday Sandstone North Sunday Cherry Glendive Sweeney Armells Reservation Sunday  Ephemeral Streams: 48 with documented fish populations	50 miles 49 miles 42 miles  87 miles 72 miles 68 miles 63 miles 53 miles 33 miles 27 miles 27 miles 15 miles				
Habitat needs and activities: Improve fish passage at current restrictions (culverts, fords, dams) and ensure future structures provide for adequate creek flow and fish passage.					
Castle Rock Lake	153 acres	Largemouth bass, Walleye  Northern pike	Wild/ Hatchery  Wild/ Hatchery	General/ Put-Grow-Take  General	Manage as a recreational fishery, supplement population through stocking if necessary.  Provide additional angling opportunity and control forage base, supplement population

**PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN**

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Bluegill, Crappie	Transfer	General	through stocking if necessary.  Provide additional panfish angling and prey base for bass, pike, and walleye. Maintain fisheries through wild fish transfers.
Habitat needs and activities: Maintain current conditions.					
South Sandstone Reservoir	114 acres	Largemouth bass, Walleye	Wild/ Hatchery	General/ Put-Grow-Take	Manage as a recreational fishery, supplement population through stocking if necessary.
		Northern pike	Wild/ Hatchery	General	Provide additional angling opportunity and control forage base, supplement population through stocking if necessary.
		Yellow perch, Crappie	Transfer	General	Provide additional panfish angling and prey base for bass, pike, and walleye. Maintain fisheries through wild fish transfers.
Habitat needs and activities: Evaluate and modify overflow structure at dam to reduce escapement of adult fish into South Sandstone Creek.					
Baker Lake	96 acres	Largemouth bass	Wild/ Hatchery	General/ Put-Grow-Take	Manage as a recreational fishery, supplement population through stocking if necessary.
		Northern pike	Wild/ Hatchery	General	Provide additional angling opportunity and control forage base, supplement population through stocking if necessary.
		Yellow perch, Crappie	Transfer	General	Provide additional panfish angling and prey base for bass and pike. Maintain fisheries through wild transfers.

**PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN**

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Habitat needs and activities: Water depth (less than 12 feet deep) is a common limitation that leads to frequent winterkills; limitation offset by frequent sampling and stocking or wild fish transfers.					
Spotted Eagle Pond	36 acres	All Species	Wild/ Hatchery/ Transfer	Restrictive regulations	High angler pressure and limited natural fish production mandates a reduced harvest: 5 fish daily and in possession, any combination of species.
		Largemouth bass, Walleye, Northern pike	Wild/ Hatchery	Put-Grow-Take	Manage as a recreational fishery, supplement population through stocking if necessary.
		Channel catfish	Wild/ Transfer	General	Provide additional angling opportunity and control forage base, supplement population through wild fish transfers if necessary.
		Yellow perch, Crappie, Bluegill	Transfer	General	Provide additional panfish angling and prey base for bass, pike, and walleye. Maintain fisheries thorough wild fish transfers.
Habitat needs and activities: Poor natural fish production, growth, and recruitment because of competition with nontarget species (migrating from Tongue River), little habitat complexity, and aquatic vegetations is limited. Offset with frequent wild fish transfers and habitat projects aimed at increasing water quality and reducing nontarget fish abundance.					
Gartside Reservoir	35 acres	Tiger muskie	Hatchery	Quality	Monitor population and supplement stock if justified to control forage base. <del>Consider</del> <del>restricted</del> harvest to 1 fish over 40 inches.
		Largemouth bass, Northern pike	Wild/ Hatchery	General/ Put-Grow-Take	Maintain fishery through regulations and stocking if necessary.
		Bluegill,	Transfer	General	Provide additional panfish angling and prey

**PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN**

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
		Yellow perch, Crappie			base for bass, pike, and walleye. Maintain fisheries through wild fish transfers.
Habitat needs and activities:					
Johnson Reservoir	21 acres	Yellow perch	Wild/ Transfer	General	Manage as a recreational fishery. Supplement population through wild fish transfers if necessary. Utilize population for transfer to other ponds.
Habitat needs and activities: Utilize yellow perch population as donor source for wild fish transfers to other ponds/reservoirs. Explore opportunities to control forage base.					
Rattlesnake Reservoir	12 acres	Crappie	Wild/ Transfer	General	Provide panfish angling opportunity, supplement population through wild fish transfers when necessary.
Habitat needs and activities: Limited water depth and severity of winter creates an annual problem of partial or total winter kill; limitation offset by aerator installation and frequent sampling and wild fish transfers.					
Homestead Reservoir	12 acres	Yellow perch	Wild/ Transfer	General	Manage as a recreational fishery. Supplement population through wild fish transfers if necessary.
		Northern pike	Wild/ Hatchery	General	Provide additional angling opportunity and control forage base, supplement population through stocking if necessary.
Habitat needs and activities: Water depth (less than 12 feet deep) that occasionally leads to winterkill; limitation offset by windmill aerator, frequent sampling and stocking or wild fish transfers.					
Marshall Reservoir,	11 acres 10 acres	Largemouth bass	Wild/ Hatchery	General/ Put-Grow-Take	Manage as a recreational fishery, supplement population through stocking if necessary.

**PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN**

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Silvertip Reservoir					
Habitat needs and activities: Water depth (less than 12 feet deep) is a limitation that leads to winterkill; limitation offset by windmill aerator, frequent sampling and stocking or wild fish transfers.					
Hollecker Pond	7 acres	Largemouth bass	Wild/ Hatchery	Special regulations	Manage as a recreational fishery, supplement population through stocking if necessary.
		Bluegill	Wild/ Transfer	General	Provide additional angling opportunity and control forage base, supplement population through wild fish transfer if necessary.
		Trout	Hatchery	Put-Take	Annual stocking of catchable sized trout for kids fishing day and general angler enjoyment.
Habitat needs and activities: Frequent establishment of undesirable species via irrigation water supply or from illegal introductions. Management of undesirable species may require pond rehabilitation by mechanical draining.					
Maier Pond	6 acres	Yellow perch	Wild/ Transfer	General	Provide panfish angling opportunity; maintain fisheries through wild fish transfers when necessary.
Habitat needs and activities: Water depth (less than 12 feet deep) is a limitation that leads to winterkill; limitation offset by windmill aerator, frequent sampling and stocking or wild fish transfers.					
Public Trout ponds: Clarks, South Fork Oil Pump, Harms, Fort Keogh	 34 acres 19 acres 7 acres 5 acres 3 acres	Trout	Hatchery	Put-Grow-Take	Annual stocking of trout for angler opportunity.
Habitat needs and activities: Water depth (less than 12 feet deep) is a limitation that leads to winterkill; limitation offset by annual stocking.					

**PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN**

Water	Miles/acres	Species	Recruitment Source	Management Type	Management Direction
Small Private Ponds/Reservoirs	Various	Trout	Hatchery	Put-Grow-Take	Public relations opportunity with landowners to provide local fishing opportunity for rural community. Maintain fishery through regulations and annual stocking.
		Bass, Walleye, Northern pike	Wild/ Hatchery	General	Public relations opportunity with landowners to provide local fishing opportunity for rural community. Maintain fishery through regulations and annual stocking when necessary.
		Crappie, Yellow perch, Bluegill	Wild/ Transfer	General	Public relations opportunity with landowners to provide local fishing opportunity for rural community. Provide panfish angling opportunity, supplement population through wild fish transfers when necessary.
Habitat needs and activities: Water depth (less than 12 feet deep) is a limitation that leads to winterkill; limitation offset by windmill aerator, frequent sampling and stocking or wild fish transfers.					



## GLOSSARY

Term or Phrase	Definition
<i>Adfluvial</i>	Life history strategy in which adult fish spawn and juveniles subsequently rear in streams but migrate to lakes or reservoirs to feed and mature.
<i>Adipose fin</i>	A small fleshy fin (with no fin rays or muscles) on the back of salmonids, Ictalurids (catfishes), and other fish between the dorsal fin and the caudal fin. When removed, it does not grow back.
<i>Algae</i>	A simple organism (either single cellular or multi cellular) that lacks the structural components of plants, but generally still conduct photosynthesis.
<i>Algal bloom</i>	A rapid increase in the amount of algae in a water body.
<i>Ampipods</i>	Aquatic crustaceans with compressed bodies (also known as freshwater shrimp or scuds).
<i>Angler day</i>	A term used to describe fishing pressure, or angling use. An angler day is one day of fishing for one angler, regardless of actual length.
<i>Anthropogenic</i>	Describes the effects of humans on the environment.
<i>Appropriation</i>	In fisheries management this term refers to the water law (irrigation) in western states known as the Appropriation Doctrine. This doctrine is essentially a rule of capture, and awards a water right to a person actually using the water. It has two fundamental principles: First in time of use is first in right. Application of the water to a beneficial use is the basis and measure of the right.
<i>Assemblage</i>	A group or collection of species making up a community of organisms at a given place in a given time.
<i>Assessment of Biological Integrity</i>	A classification tool to assess <u>water pollution</u> problems. This classification associates <u>anthropogenic</u> influences on a water body with biological activity in the waterbody.
<i>Avista</i>	Avista corporation (utility).
<i>Barbel</i>	Thread-like projections near the mouths of some fish species (e.g., catfish, carp sturgeon, etc.).
<i>Benthic macro invertebrate</i>	Aquatic animals (without backbones, including crustaceans, insects and others) that live on or within the bottom of a waterbody and are visible without the aid of magnification.
<i>Blue ribbon</i>	A designation used to define a trout stream with high recreational value.
<i>Boulder</i>	Stream substrate particle size greater than 256 mm (10 inches).
<i>Caudal fin</i>	Tail fin on a fish.
<i>Char or charr</i>	Species of fish belonging to the genus <i>Salvelinus</i> , including bull, lake and brook trout in Montana, but also includes Dolly Varden and arctic charr elsewhere in the US and Canada.
<i>Cladocera</i>	Micro crustaceans or water fleas (a type of zooplankton).
<i>Cobble</i>	Stream substrate particles between 64 and 128 mm (2.5- 5 inches) in diameter.
<i>Cold water fish</i>	This is a general term that broadly refers to fish that prefer cold water 4-15 C (40-60F), like trout, char and grayling.
<i>Community</i>	An assemblage of plants and animals, or two or more populations of organisms, occupying a specific area within a specific time.
<i>Confined channel</i>	A stream channel that is well defined and stable (Does not exhibit lateral or vertical movement).
<i>Confluence</i>	Meeting of two or more water bodies, usually refers to the junction of a river and a stream.

## PROPOSED FINAL STATEWIDE FISHERIES MANAGEMENT PLAN

<b>Term or Phrase</b>	<b>Definition</b>
<i>Consumptive fishery</i>	Population or group of fish population managed for the purpose of harvest or consumption.
<i>Cool water fish</i>	This is a general term that broadly refers to fish that prefer cool water 10-21 C (50-70), like northern pike or smallmouth bass.
<i>Critical habitat</i>	This term defines an official designation of the Endangered Species Act and refers to a physical area essential to the conservation of a listed species.
<i>Culvert</i>	A metal, plastic or concrete pipe (most often corrugated) placed under a road or railway to transport water.
<i>Dam</i>	A barrier that obstructs the flow of water either naturally (e.g., a beaver dam or landslide) or manmade (anthropogenically) that increases the water's surface elevation on the upstream side of the barrier.
<i>Delta</i>	The flat area at the mouth or confluence of a stream where alluvial deposits accumulate.
<i>Discharge</i>	Rate at which a volume of water flows past a specific point over time. Dam or stream discharge, usually expressed as cubic feet per second (CFS).
<i>DJ Act</i>	Dingell-Johnson Act or Wallop-Breaux Act provides Federal aid to states for management and restoration of fish. In addition, the act funds states for aquatic education, wetlands restoration, boat safety and clean vessel sanitation devices. Funds are derived from a tax on sport fishing tackle, gear and equipment, and motor boat fuel.
<i>DJ reports</i>	A document summarizing how federal Aid or Dingle Johnson Act funds were spent on a particular project. These reports are produced by Montana Fish, Wildlife and Parks' biologists at least every two years.
<i>Dorsal</i>	Referring to the back or top of a fish.
<i>Ecosystem</i>	Refers to a discrete community of living organisms and non-living components (like air, water and substrate) that interact to form a cohesive assemblage or system.
<i>Effective population size</i>	A term used in population genetics that refers to an hypothetical population where the number of breeding individuals in a population that exhibit genetic characteristics (including genetic drift, mutation, allelic frequencies and inbreeding) as a natural population.
<i>Electrofishing</i>	A common, effective and non-invasive technique to capture fish using an electrical field. Electro fishing is conducted using a variety of gear ranging from backpack mounted battery powered units to generator powered jet boat mounted units. All gears rely on two electrodes- a positive anode and a negative cathode.
<i>Endangered Species</i>	The Endangered Species Act (ESA) provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The lead federal agencies for implementing ESA are the U.S. Fish and Wildlife Service (FWS) and the U.S. National Oceanic and Atmospheric Administration (NOAA) Fisheries Service. The FWS maintains a worldwide list of endangered species. Species include birds, insects, fish, reptiles, mammals, crustaceans, flowers, grasses, and trees.
<i>Endemic species</i>	An "endemic" species is one that has a very limited geographic area or region. Physical, climatic and biological factors can contribute to endemism. Endemism can arise in two ways, either from a shrinking range, called paleoendimism, or more commonly as a result of reproductive isolation that leads to speciation or the creation of a new species. Because of their inherent limited geographic distribution, endemics can easily become threatened, endangered or extinct.
<i>Epilimnion</i>	Uppermost layer of water in a lake or reservoir, defined by uniform temperature.

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<i>Eutrophication</i>	A condition when too many nutrients are present in a water body. This can be a natural process, but it is often a result of human activities including the addition of fertilizers or sewage into waterways. Primarily refers to the additions of phosphates and nitrates into waters.
<i>Exotic species</i>	"Exotic" or "non-native" refers to a species that is originally from outside a particular area. This does not imply it is "invasive". It can represent anything from a fish native to elsewhere in the US (e.g., eastern brook trout), or one native to Asia (e.g., Common carp).
<i>Extant</i>	A species or even a population that is currently in existence. The opposite of "extant" is extinct.
<i>Extirpate</i>	To remove, destroy or eliminate completely
<i>Eye to fork length</i>	A common method of measuring paddlefish, from the anterior (front) of the eye to the fork in the tail.
<i>Fecundity</i>	Refers to an animal's fertility and usually refers to potential egg production capacity.
<i>Fertile</i>	Able to produce viable offspring.
<i>Fidelity</i>	Refers to being faithful or loyal and in fisheries parlance it refers to a fish being loyal to its place of origin, by returning to that place to spawn.
<i>Fin ray</i>	The supporting structure of fish's fin, made of cartilage or bone that provides rigidity but still allows the fins to be moved.
<i>Fingerlings</i>	Young fish general term describing fish between fry or larvae and adult. Most commonly used in reference to hatchery fish.
<i>Fish mark</i>	A modification made to a fish for identification (e.g., a fin clip).
<i>Fish tag</i>	A metal, plastic, or rubber object that is applied to a fish- either internally or externally - that allows for the fish's identification (either as part of a group or as an individual).
<i>Fishery</i>	A population or a group of populations of fish that receive use (either consumptive-harvest or non-consumptive, like a recreational fishery).
<i>Fluvial</i>	Relating to a river, and in particular usually refers to a life history strategy where a fish uses a river for part of its life cycle. Typically a fish will hatch in a stream, and migrate to a river to grow and mature, and return to the stream of its origin (natal stream) to spawn.
<i>Fork length</i>	A measure of fish length from the tip of the nose to the fork in the tail.
<i>Fry</i>	Newly hatched fish, commonly salmonids, and fish that don't go through a larval stage.
<i>Fyke net</i>	A hooped net that guides fish into a capture area using one or more wings and leads.
<i>Game fish</i>	Species of fish that are pursued for recreation or sport by recreational anglers.
<i>Gas Bubble Trauma</i>	Gas bubble trauma (GBT), also known as gas bubble disease, is a physiological condition that occurs among fish residing in water that is supersaturated with atmospheric gasses. In Montana it happens mostly below dams.
<i>Gas super saturation</i>	Occurs when water and atmospheric gasses must be forced together under pressure, or the capacity of water to hold gasses in solution must be reduced. Water and gasses are often mixed under pressure in deep plunge pools below dam spillways or waterfalls when gasses forced into solution by falling water.
<i>Genera</i>	Plural of genus- a taxonomic rank, a form of biological classification, above species, and below family.
<i>Genetic assignment</i>	This tool is used to identify an organism and relate it to its population source. Assignment results often contain a probability or a likelihood of appropriately matching an individual to the population.
<i>Genotype</i>	The genetic makeup of an organism.

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<i>Gill net</i>	A commonly used sampling gear for the capture of fish in fisheries management and research. A gill net is made up of horizontal or vertical panels of netting and fish are captured by entanglement, often by their gills (hence the name). Although typically used in lakes and reservoirs gill nets can be used in slow moving rivers and even drifted in rivers.
<i>Gravel</i>	A substrate whose particle size is between 2 and 64 mm (0.1 an 2.5”) in diameter.
<i>Gravid</i>	Containing eggs.
<i>Habitat</i>	The physical, biological and chemical features of a specific place that an organism lives. The term habitat is species-specific, though it often refers to a population or a community of organisms.
<i>Head gate</i>	A device that controls or regulates water flow through an irrigation structure.
<i>Heavy metal</i>	A broad classification of elements that have the potential to cause toxicity to aquatic life. In general the heavy metals commonly referred to in Montana are copper, cadmium, lead, zinc, mercury, but also could refer to many more elements.
<i>Herbivorous</i>	Feeds mostly or entirely on plants.
<i>Hybrid</i>	A cross between two or more genera or species, may or may not be fertile.
<i>Hypolimnion</i>	Bottom thermal layer of water in a lake or reservoir that is typically cold, poorly oxygenated, poorly illuminated and is removed from surface influences.
<i>Incised channel</i>	A deep stream channel, usually formed as the result of stream down-cutting vertically into substrate. This type of channel does not move laterally, but moves or cuts downward.
<i>Indigenous</i>	A fish native to a particular waterbody.
<i>Interstitial spaces</i>	Openings in or between substrate that allow for water to flow through and provides habitat for benthic invertebrates.
<i>Introduced species</i>	Animals or plants that have been moved, transported, transplanted or stocked outside their native range, also known as “non-native” or “exotic”.
<i>Introgression</i>	Movement of genes from one species to another from repeated backcrossing. This implies more than simple hybridization, and suggests multiple and repeated reproduction events with fertile offspring.
<i>Invasive species</i>	Plants or animals which are usually non-native, become a nuisance, displace of native species, and spread and become established quickly.
<i>Lateral line</i>	A row of pores along the side of fish that create a sensory organ for detecting movements of water and presence of fish and other animals.
<i>Lentic</i>	Associated with still water (e.g., a lake, reservoir or pond).
<i>Life history strategy</i>	This describes an animal’s anatomical, physiological and behavioral adaptations that reflect how an individual invests in reproduction and self-maintenance in response to their environmental conditions. Typically this term refers to the behaviors associated with migration strategies and habitat use at different stages in an animal’s life to take advantage of the environment to maximize survival and potential for offspring.
<i>Lotic</i>	Associated with flowing water (like a river or stream).
<i>Mesic</i>	Wet areas.
<i>Metalimnion</i>	Thin layer or stratum of water between the hypo- and epi-limnion also known as a thermocline.
<i>Migration</i>	An extended movement of an animal (often for feeding or reproduction), usually followed by a return to its former location.
<i>Mysis</i>	Any species of the genus “Mysis”, a small shrimp-like crustacean.

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<i>Natal</i>	Refers to the place of birth or hatching and for fish, it usually refers to a stream or section of stream to which fish will show fidelity for spawning.
<i>Natal stream</i>	Stream of origin for a fish.
<i>Native species</i>	Typically defined as a animal that was here prior to European establishment, and was not transported here or introduced by humans.
<i>Nodal habitat</i>	This term refers to migratory corridors, overwintering areas, or other critical life history requirements. This is a term that is typically used in reference to bull trout, and does not refer to spawning habitat.
<i>Non-native fish</i>	"Exotic" or "non-native" refers to a species that is originally from outside a particular area. This does not imply it is "invasive", and can represent anything from a fish native to somewhere else in the US, or one native to Asia.
<i>Non-game fish</i>	Refers to the fact that the species have not been classified in Montana statute as "sport" fish.
<i>Pelagic</i>	Lives in open water.
<i>Phenotype</i>	The physical makeup of an organism, or the organism's observable properties or form (like color, and morphology).
<i>Photosynthesis</i>	The process by which plants make oxygen.
<i>Phytoplankton</i>	Microscopic, free-floating plants.
<i>Picivorous</i>	Fish-eating.
<i>Piscicide</i>	A natural or synthetic compound that kills fish.
<i>PIT tag</i>	Passive Integrated Responder. A small internally applied electronic tag that is activated by an externally powered device to identify an individual animal through a alpha numeric code.
<i>Plankton</i>	Refers to all free-floating plants (phyto-plankton) and animals (zoo-plankton), usually microscopic.
<i>Pool</i>	A stream or river habitat type characterized by a low gradient (<1%) that is deeper and wider than adjacent habitat units.
<i>Population</i>	Individuals of the same species in a discrete geographic area and a specific time. This can also refer to a group of related species (e.g., trout).
<i>Prairie Pothole</i>	Ponds, pools and wetlands found in depressions that were formed by glacial activity.
<i>Recreational fishery</i>	Population or group of fish population managed without the purpose of harvest or consumption. This is typically categorized as a "catch and release" fishery.
<i>Redd</i>	A spawning nest or bed constructed by trout or salmon. The redd is a depression made in gravel (usually in a stream but not always) and is composed of a pit (where material for the "nest" is excavated) and a tail spill where the excavated material is piled to cover and protect the eggs.
<i>Redd survey</i>	A common monitoring technique where trout or salmon nests (redds) are counted by observers.
<i>Reservoir</i>	Artificial lake or impoundment where a dam is used to store water.
<i>Resident</i>	A life history strategy that does not involve migration.
<i>Retention time</i>	Length of time that water is stored in a waterbody (usually describes a reservoir).
<i>Riffle</i>	Shallow reaches of streams where substrate causes breaks in the surface water causing waves, or ripples.
<i>Rip rap</i>	Typically angular rock, but can also refer to rubble, broken concrete and other things used to armor a stream bank to prevent erosion.
<i>Riparian area</i>	Relating to the margin of a river, stream, lake or other waterbody. Usually refers to vegetation types and habitats along water bodies.
<i>Rotenone</i>	A commonly used piscicide derived from a South American vine.

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<b>Term or Phrase</b>	<b>Definition</b>
<i>Salmonid</i>	Any member of the family Salmonidae including trout, salmon, charr, whitefish and grayling.
<i>Sand</i>	Substrate size that ranges from 0.062 and 2 mm (0.00003- 0.01”) in diameter
<i>Scuds</i>	Amphipods or commonly called freshwater shrimp.
<i>Scutes</i>	An external or bony plate, like those found on sturgeon.
<i>Silt</i>	Very fine substrate with particle sizes ranging from 0.004 to 0.062 mm (0.00002- 0.0003) in diameter.
<i>Sinuosity</i>	A measure of the curvature of a stream or river and describes the general pattern.
<i>Spawn</i>	To produce or deposit eggs, typically refers to fish, but can also refer to any aquatic animal (like mussels) or semi aquatic animals (like toads).
<i>Species</i>	The most basic unit of biological classification. In its most clear definition, a species is one that can produce viable (fertile) offspring. However, many fish of different species can produce viable offspring (hybrids).
<i>Species of Concern</i>	Is a protective designation by Montana Fish, Wildlife and Parks to wildlife species that are at risk.
<i>Sport fish</i>	Refers to any fish that has a recreational value (including harvest) and has management or regulation tied to it. Often this is synonymous with “game fish”, which are species of fish that are pursued for sport by recreational anglers.
<i>Standard length</i>	The most accurate measure of fish length, because it relies on skeletal length from the tip of the nose to the last vertebrae. Typically only used in the lab.
<i>Sterile</i>	An organism that is unable to reproduce sexually.
<i>Stratification</i>	Arrangement of water into distinct horizontal layers that are associated with temperature, dissolved oxygen and suspended particles.
<i>Stream order</i>	A hierarchical classification of stream based on the number of branches (or tributaries). For example, a first order stream has no tributaries, a second order stream has two first order streams flowing into it, and a third order stream is the result of two second order streams combining.
<i>Substrate</i>	Materials that form the base of a waterway, either organic or minerals. Substrates are usually classified into categories based on their diameter.
<i>Summerkill</i>	A fish killing condition that typically affects lakes in the summer as a result of high water temperatures and low dissolved oxygen. Often the low dissolved oxygen is a result of plants taking up a lot of oxygen at night causing very low amount of oxygen during the dawn hours (also known as a dissolved oxygen or DO “sag”), before plants can produce oxygen.
<i>Telemetry</i>	Measurement and transmission of information via radio or ultrasonic signal to a receiving unit. A technique used to locate and/or track tagged fish.
<i>Thalweg</i>	Path of a stream of river that follows the deepest part of the channel and usually contains the greatest amount of energy.
<i>Thermocline</i>	Thin layer or stratum of water between the hypo- and epi-limnion also known as a metalimnion.
<i>Threatened Species</i>	A category of protection under the ESA (e.g., bull trout).
<i>Total length</i>	The most common measure of fish length- the maximum length of the fish form the tip of the nose to the tip of the tail (when the lobes of the tail are compressed).
<i>Triploid</i>	A fish having three sets of chromosomes, and, as a result, is not capable of reproduction, it is sterile.
<i>Vermiculatons</i>	Worm like markings on the skin as commonly found on brook trout dorsal fins.

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<b>Term or Phrase</b>	<b>Definition</b>
<i>Wallop-Breaux Act</i>	Dingell-Johnson Act or Wallop-Breaux Act provides Federal aid to states for management and restoration of fish. In addition, the act funds states for aquatic education, wetlands restoration, boat safety and clean vessel sanitation devices. Funds are derived from a tax on sport fishing tackle, related fishing gear and equipment, and motor boat fuel.
<i>Warm water fish</i>	This is a general term that broadly refers to fish that prefer warm (between 15-17 C or 60-80 F) water temperatures.
<i>Weir trap</i>	A barrier than spans a stream to divert fish into a holding pen.
<i>Whirling disease</i>	A disease caused by a myxosporean parasite ( <i>Myxobolus cerebralis</i> ), in trout and other fish.
<i>Wild fish</i>	A fish that is reproducing and sustaining a population without the help of humans.
<i>Winterkill</i>	A specific event when fish or other aquatic organisms are killed usually after a prolonged period of snow or ice cover and usually related to depletions in available oxygen as a result of the lack of photosynthesis.
<i>Xeric</i>	Locations that lack water.
<i>Zooplankton</i>	Small, often microscopic animals, typically rotifers, copepods and cladocerans. Very important for food, especially in ponds, lakes and reservoirs.